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PREFACE.

IT is not the purpose of this book to furnish an exhaustive treatise on the Art of Teaching. That most important part of the Public School Teacher's work, comprising the methods of controlling and instructing classes of young children, must necessarily find its appropriate place in any complete view of School Method. But, standing somewhat apart from the rest of School work, having distinctive features of its own, and often one of the first occupations to which a young Teacher is put, particularly in Infant Schools, is the giving of Oral Lessons. As this is one of the commonest and most characteristic parts of the work of every Infant School Teacher, so is it in some respects one of its most difficult parts. It is as a practical guide to the discharge of this branch of daily duty that this book is offered.

It gives suggestions on—

1. **The Arrangement of Schemes of Lessons,** in accordance with the requirements of the Code as interpreted by the Instructions to H.M. Inspectors.
2. **The Construction of Notes of Lessons,** viz. Outline Notes, for purposes of Examination, etc.; Full Notes; and Notes of Lessons of Revision. Also—
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PART I.

INTRODUCTION.

ARRANGEMENT OF COURSES, OR SCHEMES OF ORAL LESSONS FOR THE INFANT SCHOOL.

BY common consent, Oral teaching, in the form known as Gallery, Collective, or Class lessons, occupies a foremost place in all provision for the teaching of Infants. The reason of this is obvious, if we consider that no other method so well combines the training of the intelligence of young children, the adding to their general knowledge, and their acquirement of a knowledge of language, and of facility in its use. Accordingly, the Code (Art. 106 (*b*)) lays much stress on the Inspector's Report as to the provision made in Infants' Schools for 'simple lessons on objects, and on the phenomena of nature.' This is interpreted, in the instructions to H.M. Inspectors, as meaning that 'a good Infant School should provide a regular course of simple conversational lessons on objects, and on the facts of natural history.' Further, it is required that 'the mistress early in the school year should draw up and enter in the Log Book a course of thirty or forty collective lessons, *e.g.* on animals; on such subjects as coal, glass, and salt; on common employments, as paper-making, cotton mill, house-building, one of the trades of the district being chosen in preference; on form and colour, food, plants, and clothing; on simple facts in nature, as rain, frost, the seasons; on familiar scenes in common life, as the post-office, a shop, a railway, washing, or harvest. Each of these should in the course of the year be given two or three times.'

The teacher's first care must therefore be to draw up such an arrangement or scheme of lessons. Such lessons may be conveniently grouped under the following heads: Animal Life, Vegetable Life, Common Objects, Natural Phenomena, Common or Social Life, Miscellaneous lessons. Lessons on Form and Colour may be most usefully merged in the kindergarten lessons, or, if taken separately, they should form a distinct series apart from the foregoing subjects.

(*a*) Suggested Scheme of forty Lesson Subjects for an Infant School in which one Oral lesson is taken daily:—

MONDAY.	TUESDAY.	WEDNESDAY	THURSDAY.	FRIDAY.
Object Lessons.	*Animal Life.*	*Plants or Plant Life.*	*Natural Phenomena.*	*Common Life, Miscellaneous.*
A Chair	The Cat	The Oak	Rain	A Railway Train
Salt	The Hen	How Seeds grow	Clouds	A Farm Yard
Cup and Saucer	The Herring	The Daisy	Rivers	Catching Fish
An Apple	The Butterfly	Grass	The Sea-shore	Description of a Ship
Lesson of Revision	*Lesson of Revision*	*Lesson of Revision*	*Lesson of Revision*	*Lesson of Revision*
Glass	The Lion	The Palm Tree	The Sun	A Harvest Field
Glass of Water	The Eagle	Wild Flowers	Winds	The Postman
Paper	The Bee	Ivy	Ice	A Grocer's Shop
Milk	The Robin	Water Plants	Fire	House-building
Lesson of Revision	*Lesson of Revision*	*Lesson of Revision*	*Lesson of Revision*	*Lesson of Revision*

(*b*) Suggested Scheme of forty-two Lesson Subjects for an Infant School in which an Oral lesson is taken on three days of each week :—

MONDAY.—*Common Objects*—Coal. Sponge. Leather. Coins. A Book. A Chair. *Lesson of Revision.* Salt. Glass. An Apple. A Cocoanut. Paper. Cup and Saucer. *Lesson of Revision.*

WEDNESDAY.—*Living Things*—The Cow. The Hen. The Mackerel. The Spider. The Camel. The Robin. *Lesson of Revision.* The Cod. Flies. The Dog. The Sea Gull. The Crab. The Bee. *Lesson of Revision.*

FRIDAY.—*Natural Phenomena, etc.*—The Earth. The Air. Fire. Water. Blacksmith's Shop. House-building. *Lesson of Revision.* The Sea. Clouds. Rain. Frost. Travelling. Sowing and Reaping. *Lesson of Revision.*

Instead of the Lessons of Revision being placed as here indicated, it might be thought preferable to take a Revision Lesson weekly, on one of the alternate days, Tuesday or Thursday.

(*c*) In cases in which it is considered desirable to give a course of lessons on one special topic, they may be arranged in some such series as follows :—

OUR CLOTHING.

The clothes I wear.
A boy's coat.
A girl's dress.
A pair of gloves.
Boots and shoes.
Cotton — the wool and thread.
Wool—worsted, etc.
Silk.
Linen—thread, etc.
Leather.
How clothes are made.
Needle, thimble, scissors.

OUR HOUSES.

The house I live in.
The building of the house.
The work of the mason or bricklayer.
The work of the carpenter.
The work of the slater.
The work of the painter.
The rooms of the house.
How the house is lighted.
How the house is warmed.
The water for the house.
The furniture for the house.

FORM AND COLOUR.

The forms of things.
The box shape — a cube.
The outside of things —surface.
Lines and corners—a ball, a cylinder, a cube.
Some common forms—square, circle, triangle.
The colours of things.
White and black.
Red, yellow, blue.
Orange, green, purple.

In arranging lists of lessons, regard should be had to the circumstances of the scholars, and to the conditions of the school for which they are intended. While there are many subjects suitable to all classes of scholars, the surroundings and modes of life of children, in agricultural districts, in seaports, in manufacturing towns, and in other great centres of population, so differ each from the other, that care must be taken to include among the subjects presented to their notice such matters as will interest and inform them as to things with which they are familiar, and as to facts and phenomena which they have the means of observing and verifying in their daily life.

PREPARATION OF NOTES OF LESSONS.

Every lesson should be the outcome of the teacher's own knowledge of the subject. That is to say, the lesson, as represented by the Notes, should follow, and not precede, the teacher's own complete understanding of the matter of it. This, perhaps, can scarcely be expected in completeness, in the case of young teachers, many of whom are called upon to give lessons day by day, without having the means and opportunity of previously storing their minds with the information on which the lesson should be based. This leads often to the practice of 'getting up' the lesson, and committing it to memory as a preliminary to giving it to the class. The teacher, whom yet it would be wrong perhaps to condemn too hastily, is thus hampered in the delivery of the lesson by imperfect knowledge, and by the necessity for a strict limitation to what is remembered of the prepared Notes.

Preliminary.—The essential preliminary to an intelligent writing of the Notes of a lesson, then, is, that the teacher shall herself be fully possessed of a knowledge of its subject-matter. To obtain this, there should be a careful reading of what is accessible as to the matter, and some careful thought as to the bearings of it. When a sufficient idea of what the lesson shall consist of has been thus gained, the next step will be to arrange the information in the order supposed to be suitable to the class. For this purpose there should be in the mind of the teacher as clear a realization as can be secured of the nature and condition of the class, so as to adapt matter and method to its requirements.

Divisions and Headings.—Regarding most subjects, it will be found that there are a few prominent points round which the rest of the matter clusters, and which follow each other in natural and definite sequence. These points suggest the usual divisions of the lessons, and their headings, which aid the memory both of teachers and scholars, and form convenient halting-places for revision during the progress of the lesson; *e.g.* a lesson on an animal may comprise (1) General description, as illustrated by a picture or a model; (2) Place and way of living—in course of which an account of its habits will lead on to (3) Structure: or the points may be (1) The place in which it lives, and what it feeds on; (2) What it needs to obtain its food; (3) Uses, or how caught. Technically put, this would be—Habits, Structure, Uses. Again, in an object lesson, as Paper—(1) What the eye and the hand teach about it; (2) What it is used for; (3) How it is got; *i.e.* Qualities, Uses, Sources, and Manufacture.

The 'Introduction.'—It is of much importance that a lesson should *begin* at the right point and in the right way. This has given great prominence to the 'Introduction' in the Notes of lessons, and often indeed leads to the making of it, unnecessarily, a distinct division. No rule on this head, nor indeed on any other, can be laid down for invariable use. Lessons usually begin most effectively at the point at which the children come most closely and naturally into contact with the subject of it, and, certainly, at whatever point will most surely secure their attention by engaging their interest. It is well usually to begin with a few questions, recalling what the children know of the subject of the lesson, or of related matter, to which the new information can be conveniently welded.

Illustration.—It will be next necessary to consider what difficulties are likely to present themselves to the children in understanding any part of the lesson, and the way in which such difficulties should be met, by explanation or other expedient. This leads to a consideration of the illustrations to be employed. These should be specially noted, and as to where and how they should be used for making clear what is obscure, or for impressing what may be already understood. All this is really preliminary to the writing of the

Notes. It may be a mental process aided by rough jottings on paper.

How to write Notes of Lessons.

We next proceed to the writing of the Notes. These are of two kinds, usually spoken of as 'Outline Notes' and 'Full Notes.' The latter, when fully elaborated, would show the complete process of the lesson, in which every question and answer and statement would be detailed. Such Notes are irksome, both in the writing and in the remembering of them. If given as they are written, they have the disadvantage, too, of requiring a strict adhesion to the given form of words, questions and answers, etc. If this be rigidly followed, it destroys the naturalness of the lesson. If, however, as is much more likely, the order of arrangement be disturbed, as, for example, by unexpected answers or unlooked for difficulty of any sort, it leads to sure embarrassment and confusion of thought.

Full Notes.—A reasonable compromise between the two extremes of brevity and of fulness will be found in such a style as that of the bulk of the Notes which follow in this book. They are sufficiently full to give the requisite accuracy and completeness for the teacher's use without being burdensome in quantity.

Outline Notes.—But Notes of another kind will be needed. For the purpose of aiding the memory, and especially for examination purposes, the proper form is that of 'Outline Notes.' These can be so written as to show what is to be taught, its arrangement, illustration, and revision, and to give a general idea of the method. Specimens of such Notes are subjoined (pp. 12–18).

Matter and Method, why not separated.—It will be observed that no attempt is made to separate Matter and Method. There are some subjects in which it is convenient to indicate special features of method or of illustration apart from the general run of the matter. But in ordinary practice it is impossible to separate them in the process of lesson-giving. These parts do not exist separately, they are interwoven throughout the lesson. From an examiner's point of view, it may be convenient as a means of judging of the lesson. But from the practical point of view of the teacher, the matter assumes a totally different aspect.

A careful examination of even the best printed Notes of lessons of this form will show the impracticability of keeping separate the matter and the method. Either the one or the other finds its place in the wrong column, or the method is reduced to a few meagre directions or indications, which may be much more conveniently united with the matter in the Notes, as they must be in the Delivery, of the lesson. The attempt to follow this method of writing the Notes usually induces a too technical and stilted form of Notes, in which the mechanism overrides the essential parts of the lesson itself. At the same time it should be said that there is no one specific mode of writing Notes infallibly and invariably right, to the exclusion of all others. Each teacher should follow that plan which experience proves to be most helpful in securing a clear, accurate, and complete help to the giving of the lesson.

What is required in Notes of Lessons.—Whatever plan is adopted, the Notes should indicate the Matter, its arrangement and chief divisions; the Illustrations, their place and use; the chief features of Method, especially as to when and how questioning is employed, whether to obtain from the children what they previously knew, or how they are following the teacher; and also the Test applied to gauge and to impress what has been communicated in the lesson. And the Notes should be such as to be of actual practical use in the work of teaching, and not merely serve the purpose of presentation to an Inspector or Examiner.*

Language; use of New Words, etc.—The language employed in writing the Notes should be such as will be actually used in giving the lesson. The use of technical and unusual words should be avoided as much as possible in infant lessons. When employed, as they sometimes must be, a clear explanation of the idea, the meaning of the term, should precede the term itself. The new word should afterwards be called for again from the children, and used by them to ensure their understanding of it. Some indication of this process should appear in the Notes. Occasionally, doubtless, technical expressions may be employed in the Notes, for brevity, and even clearness, which would not occur in the lesson; but, as a rule, the language in words and in form should, in the Notes, correspond to that used in the giving of the lesson.

---

* 'No experienced person would believe how they (Notes and Lessons) become disconnected in some teachers' minds. I have known a school in which "Notes of Lessons" were regularly prepared by the pupil teachers for the principal teacher, but in which no one such lesson was ever delivered. Incredible as it may seem, I found, on inquiry, that no lesson was ever given from the notes prepared, and no notes were ever prepared for the lesson actually given. In well-written notes of a lesson the teacher has the class in her mind's eye, always before her, and the spirit of practice breathes through the written notes.'—Fearon's *School Inspection.*

Revision, or Blackboard Sketch.—The place and the general form of the *Revision* should be indicated, as to whether it is to be by collective, or by individual questions, and in some instances it is well to give specimens of the form of questions to be used.

The *Blackboard Sketch* should also be indicated in the Notes.

SOME PRACTICAL HINTS ON THE GIVING OF GALLERY LESSONS.

1. **Lesson Preparation.**—The whole scope and purpose of this book assumes that this must be carefully and intelligently done. Whatever the plan, or the proposed method, of the lesson, there can be no effective teaching without a clear knowledge on the part of the teacher of *what* is to be taught, and *how* it is to be done. What has been already said about the preparation of the Notes need not be repeated here. As to the use of Notes, it must be understood that no Notes prepared by one person can be properly used by another *precisely as they are written.* They may be most usefully employed in respect of the matter, its arrangement and its general mode of treatment, and as guides to the preparation of other similar Notes, but they must be cast in the mould of the teacher's own mind and thought, before they can be profitably used in actual class teaching.

2. **Physical Conditions.**—The children should be seated easily and comfortably, and without crowding. All school seats should be provided with backs. The temperature, the lighting, and the ventilation should be duly cared for. There should be nothing within the view of the children, as other classes or persons, likely to distract their attention from their teacher and their lesson.

3. **Disciplinary Conditions.**—The first is that the teacher should so stand as to have the class within easy command of eye and voice. Control is as necessary as instruction. There can be no effective teaching without it. It is well known that where failure occurs it is much more frequently and largely due to lack of disciplinary skill than to lack of either, information, or earnestness, or knowledge of method. The source and centre of disciplinary power is in *the personal influence of the teacher*. Everything which contributes to this personal influence is valuable. The personal qualities of manner, voice, command of language, and general tone and deportment, should be brought into exercise. It is here that that valuable element of character, known as *tact*—the art of doing and saying the right thing, at the right time, in the right way, or the avoiding of its opposite—comes into exercise. The end of good discipline is the securing an orderly and attentive class. Especially is it necessary to secure—

4. **Attention.** — The kind of attention requisite for our purpose is produced by the union of an orderly body and an attentive mind. The external semblance of order, covering as it sometimes does a listless attitude of mind, will not suffice. It can only be obtained by a combination, on the teacher's part, of constant watchfulness and prompt checking of misbehaviour, and the awakening and sustaining of *the children's own interest* in the lesson. This may be effected by appeals to their curiosity, wonder, fancy, and whatever contributes legitimately to their pleasure. It is not to be had by asking for it, however urgently, and it cannot be had by appeals to the children's fears.

5. **Method.**—This may be taken to mean the particular mode adopted in imparting instruction, whether by direct statement of the teacher, or the indirect mode of 'training'—

i.e. of so directing the intelligence of the children as to lead them to discover, and apprehend, and express, so far as is practicable, for themselves. It includes the adoption of the various resources and expedients proper to the art of teaching:

i. *Questioning.*—All teaching should have in it a large employment of questions. Every young teacher especially should give careful heed as to how and when to employ them, for recalling what the children already know, for helping them to understand what is being taught, and for revising and testing how much of it is being learnt, and no part of the class must be neglected in this process. The dull, the slow, and the inattentive, should be especially stimulated by suitable and well-applied questions.

Of hardly less importance is it to deal well with the *Answering.* This is often overlooked. Yet no teacher should neglect the correction of bad answers, whether defective or otherwise faulty, the encouragement of good answering, and the diffusion throughout the class of the power to answer.

ii. *Illustration.*—The fondness of children for seeing and doing, and the ready and natural means this affords for the acquirement of knowledge, gives special value to this feature of teaching in the case of young children. Pictures, models, the actual things spoken of, and simple experiments of processes, should all be freely used. And not by the teacher only, but, whenever it is practicable, the children should themselves take part in what is being done.

iii. *The use of the Blackboard.*—The value of this as a help in teaching can scarcely be overrated. Every young teacher should acquire facility in its employment; and this, both for sketching the outlines of things and for printing and writing. The verbal sketches of lessons can be rightly employed only when the children are advanced sufficiently to read and understand what is placed before them. They form incidental lessons in learning to read, of no mean value. The words should be few, and so clearly written, or, better, put in print form, that all the children shall easily see it. This must be remembered, too, in respect of everything shown to the class A considerable number and variety of specimens of blackboard sketches will be found appended to the Notes of Lessons.

iv. *Language.*—A good command of language, simple, suitable, and clear, with facility and ease in its use, is a source of great power in a teacher. It comprises a good knowledge of easy words; a ready changing of one from another; of inversion of sentences; a clear knowledge of the meanings of words; and great clearness and distinctness of speech.

v. *Manner.*—Let it be ever remembered, that a bright and winsome manner, a quick sympathy with children, a liking for the work itself, an ever sustained and real interest in it, are essential to the happiness and success of the teacher.

PART II.

NOTES OF LESSONS.

I.—OUTLINE NOTES.

These are intended as Specimens of Notes suitable for Examination Papers, and for aids to the Teacher's Memory.

An Object Lesson.

PAPER. See p. 35.

I. **Introduce** by showing specimens of several sorts. Bring out by questioning what the children *see* of its *qualities* and *know* of its *uses*, as *thin*, *white* paper for writing and printing; *strong*, *brown* paper for parcels; *thin*, *coloured*, for ornaments, etc. Awaken interest by referring in general terms to the many ways in which paper is seen to be in daily use, in school, in shops, at home.

II. **Qualities and Kinds.**—Paper is *useful* because of its—

i. **Qualities.** Show those common to all paper, *thin*, *flat*, easily *folded*, *torn*, *crushed*, *burnt*, becomes *pulpy* when wetted, etc.

ii. **Kinds.** Children to help in arranging specimens as follows.—

(1) **Wrapping Paper**: *brown*, *stout*, *coarse*, *tough*.
(2) **Writing Paper**: *white*, *thin*, *smooth*, *shiny*, or *dull* (compare sorts).

(3) **Fancy Paper**: *thin*, *soft*, *easily broken*, *delicate*, etc.

(4) **Blotting Paper**: *soft*, *thickish*, *dull* (illustrate its use).

(5) **Drawing Paper**: *stiff*, *smooth*, etc. (show sorts).

III. **Uses.**—By description and questioning, bring these out in respect of each kind: errands to shops, with wrapping paper; letters, newspapers, and books for writing paper; when and how blotting paper is used, etc.

IV. **Paper-making.**—Made of rags, bits of rope, straw, etc. Show and contrast with paper. How changed? By **Sorting, Cleaning, Tearing, Pulp-forming, Pressing.** Describe each. Specially explain how the sticky, thin pulp is spread out on the wire frame. (Illustrate by the rolling of the thin sheet of paste for pie crust.)

Revision by collective and individual questions at end of each section, and recapitulation at the end by aid of—

Blackboard Sketch. See p. 37.

Outline Notes of Lesson on an Animal.

THE LION. See p. 68.

I. **General Description.**—Show picture, and, by questions and description, set forth clearly a general idea of its appearance and parts:

i. **General.**—Point out in succession, name, and describe in general terms, *head*, *body*, *tail*, *legs*, *feet*, *hairy covering*, and *mane*.

ii. **Special**:—

(1) **Head**: shape, firm set on neck, etc.

(2) **Eyes**: large, glittering, where placed.

(3) **Mouth**: great size. **Whiskers** or **feelers** on each side.

(4) **Teeth**: large, sharp, strong, pointed (specimen on Blackboard sketch).

(5) **Ears**: shape, how placed, etc.

(6) **Nose**: wide nostrils, placed in front.

(7) **Feet:** shape, the soft pads; toes, five on front, four on hind feet.

(8) **The Claws:** strong, sharp curved (draw on Board). Can be drawn in and out (illustrate by scissors and sheath).

II. **Comparison with Cat,** to illustrate structure and habits by example familiar to children. Bring out, first, by questions, the chief characteristics of form and structure of the cat, especially of *head*, *legs*, *feet*, *claws*. By help of the picture of lion, compare these throughout. Refer to other similar animals, *tiger*, etc.

III. **Connection of Structure with Habits.**—The lion is a **Beast of Prey**. Meaning of this? Lead on to description of **where and how it catches its prey**. Describe vividly the home of the lion; the dense forest; watching for prey by night: the roar; the spring; the capture, etc. Its great strength: for this and size, compare with horse.

For revision, use—

BLACKBOARD SKETCH.

LION—Beast of Prey.
,, Strong, Fierce, Active.
,, Like a Large Cat—
In Shape, Teeth, Claws.
In Way it Moves.
In Way it Catches Prey.

Outline Notes of Lesson, on a Bird.

THE EAGLE. See p. 74.

I. **General Appearance.**—Show picture of the eagle. By questioning and picturesque statement, picture vividly its general description: size (illustrate by swan), head, body, wings, legs, feet, claws, feathers, its bold, fierce look, etc.

II. **Home and Habits.**—i. **The Home:** A nest, how made, where placed; why on high hill-tops; the eggs; the young birds (eaglets); their food; what it is, how got. So lead on to—

ii. **Habits.** — **The Eagle a Bird of Prey.** What this means. Describe vividly **how it gets its food.**

(1) **How it finds it:** Its high flight in the air—Why? That it may see a wide space of ground: use of its *keen eyesight.*

(2) **How it reaches it:** Its *swift flight:* use of strong wings.

(3) **How it catches it:** The *strong, sharp claws* (talons).

(4) **How it carries it home:** Its *great strength.*

(5) **How it kills and tears it in pieces:** Its strong, sharp, *curved beak.*

III. **Kinds of Eagles.**—*Golden eagle,* largest and finest; *Sea eagle* (osprey), catches fish, lives near sea.

BLACKBOARD SKETCH.

EAGLE—A Bird of Prey.
„ Is Large, Strong, Fierce.
Sight, Keen; Flight, Swift.
Claws } Sharp, Strong, Curved.
Beak }
Nest, on high Hill-top.
KINDS—Golden Eagle, Largest.
Sea Eagle, catches Fish.

Outline Notes. Natural Phenomena.

THINGS FOUND IN THE EARTH.* See p. 111.

(*Specimens of the various things spoken of throughout the Lesson to be provided for illustration.*)

I. **Introduction**; a brief, graphic description of the surface, or general appearance of the earth; the living things and plants upon it; its fields, hills, valleys, etc. It is partly land, partly water. This lesson about the *land part*. Of what made up. Refer to these; earth or mould, gravel, sand, rocks, etc.

II. **Rocks.**—i. **Stones.**—Show specimens; name; point out differences, etc. *Granite, sandstone, limestone, chalk*, etc. These are small parts of the great *rocks*. They are called? *Stones*. Where seen; how used, etc.

ii. **Rocks.**—These form the great *hills, mountains, sea-cliffs*. They lie below the ground on which we tread. Name, and describe generally, a few of the chief rocks.

iii. **Uses of Rocks.**—*They hold up the looser parts of the earth, form hills*, etc. Are used for *buildings;* speak of uses of *chalk, slate, marble*, etc.

(*Revision.*)

III. **Metals.**—i. Show specimens, and describe **what Metals are.** Where found. Difference between them and stones. When struck, or placed in fire, etc.

ii. **Kinds and uses of Metals.**—Show specimens, ask for names, uses, why so used, etc.

IV. **Coal and Salt.**—Describe and compare. Speak of where, and how, got. Their uses, their great value to us, etc.

V. **Earths.**—Let the children examine and compare each.

i. **Garden mould.**—Colour, uses, of what composed.

ii. **Clay.**—Hard when dry, "sticky" when wet; use of this; compare with other earths; things made of clay? etc.

iii. **Sand.**—Examine as before. Point out the sparkling, hard, separate grains. Where found, their uses, etc. *Gravel made of little stones and sand.*

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* These Notes would serve as a specimen of Outline Notes for a lesson suitable to a somewhat advanced class, say for Second or Third Standard. For method of adapting it to an upper Infants' Class, see full Notes of the Lesson on this Subject on p. 111.

(*Revision.*)

BLACKBOARD SKETCH (for the Elder Class).

EARTH.—Made up of—
I. ROCKS.—Hard, heavy, break when struck.
" *Form Hills, Mountains, Cliffs.*
Stones are small pieces of } *Rocks.*
Granite, Sandstone, Slate, are }
II. METALS—Found in Rock.
" *Melt in fire, bend when struck.*
Gold, Iron, Lead are Metals.
III. COAL and SALT—Dug from Earth.
IV. EARTHS are Sand, Clay, Mould.

Outline Notes of Lesson.

THE CRAB.

(*For illustration: a good picture, and specimen, of the Crab. Introduce by reference to general appearance and parts.*)

I. **General Description.**—By questioning and statement, take in succession—1. *The body.* 2. *The legs.* 3. *The pincers.* 4. *The horns or feelers.* 5. *The eyes.* 6. *The mouth.*

II. **Where and how it lives.**—Its home in the sea, on the rocks and sands, and among the seaweed of the shore. Describe its curious mode of running sideways: its being sometimes out of the water, sometimes in it. Other kinds of shell-fish. Their food; the flesh of other horny creatures; the sea-weed, etc.

III. **How the Crab grows.**—Its hard, stiff shell does not grow, but the body does. Illustrate by reference to little boy's jacket or boot, which cannot get larger. Why the *crab must change its shell.* The shell *grows out of its body.* (Illustrate by finger nail.) The old shell is cast off. The crab hides in a hole in the rock while the new one grows.

IV. **Different kinds of Crabs.**—i. **The Common Crab.** Where and how caught; use for food, etc.

ii. **The Green Crab.**—Seen on our sea-shores; not good for food.

iii. **The Spider Crab.**—Named from shape and look.

iv. **The Hermit Crab.** — Describe its finding and living in the empty shell of another fish. Why called a *hermit* crab.

v. **Fresh-water Crabs.**

vi. **Land Crabs.**—Found in hot lands; live in the thick grass, and in holes in the earth.

(*Revision.*)

BLACKBOARD SKETCH
(to be repeated by the Class).

The Crab is a shell-fish.

It lives in rocks in the sea.

It casts off its shell when too small.

A new shell grows on its body.

There are several kinds of Crabs.

Some are not good to eat.

II.—FULL NOTES.

These Notes are intended as specimens of the matter, arrangement, and general style of language, and of the method, and illustrations, suitable for Lessons to young children.

Group 1.—Object Lessons.

SALT.

(*Materials desirable for illustration: Salt, Sugar, Chalk (in lump and crushed), glass of water, bits of pottery, glazed and unglazed.*)

I. **Introduction.**—Show a lump of salt—ask its name? Speak of its frequent *use at home;* how used, etc.—no dinner without it; what things used with—watch mother getting dinner ready; what she does with it. *Salt is very useful* (repeat). Who in the class have seen it bought? Its price? The great piece that can be got for a penny. *It is very cheap.* Even the very poor can get it: the good of this, etc.

II. **Qualities.**—We must learn *what kind of thing salt is.* Look at the lump. Its colour? how shaped; can be easily *cut* (show this) and *crushed;* how small the little bits are—these are called *grains.* Compare with lump of sugar—how like it is. Show powdered sugar, salt, and chalk. The salt and sugar *sparkle, glisten in the light;* the chalk is *dull,* is easily known from the other two. Not so easy to know *salt* from *sugar;* let some try. The *eye* and the *fingers* only will hardly do. *Taste* a bit of each. The sugar is?—*sweet;* the salt is?—*salt!* there is no better word, no other thing tastes exactly like it. When older you will know another name for it. How we find the likeness and the difference of these things; by *seeing, feeling, tasting.*

(Put a little in a glass of water, stir it.) What has become of the salt? It cannot be seen, it seems to melt away; we say it is *dissolved.* What else dissolves in this way? *Sugar in tea.* Put a small lump in the fire, or hold it over a gas-flame. What happens now? (Let all repeat) —*Salt dissolves in water —salt melts in fire.*

(*Revise by questioning.*)

Now let us think *how salt is used.*

III. **Uses**—(*a*) **For eating.**—We use it at home for *eating*, with other things. Name these things. Why put with them? It makes them *taste nice.* More than this, it is *good for food;* it helps to keep us in good health. The baker puts it in our bread; mother puts it in our puddings, porridge, etc. Different kinds of animals, too, need it and like it—horses, cattle, sheep, etc.

(*b*) **Preserving.**—Salt is put with *meat* or *fish* which is to be kept for a long time. Why is that? It is to keep it good for food, else it would become bad, and could not be eaten. We must learn a new word for this use. *Salt preserves meat.*

(*c*) **Glazing.**—But salt is used in other ways than for eating. Men mix it with other things to *make glass.* Look at a cup or plate; pass your fingers over it—how *smooth* and *shiny* and *firm* it is. Before the cup is finished it is *rough* and *dull.* It is dipped in water that has much salt in it. What does the *water* do to the salt? Then the cup is put into a very hot oven. What will the *heat* do to it? So the cup or plate is covered with this thin, hard, glassy coat. This is called *glazing.*

(*Revise.*)

IV. **Sources.**—We must now learn *where salt is got.*

i. There is much salt **in the sea.** Every little one who has paddled in the water on the sea-shore is likely to find this out. How many have tasted it? It is mixed with the water in the great sea everywhere. But how can it be got out? In the summer time pits are dug in the sand and the sea-water let into them. The sun shines down day by day, and dries up the water—the salt is left behind, and can be scraped up.

ii. **In the earth.**—Great rocks of salt lie deep in the earth. What else is found in that way? How do men get the coal out? What is the deep hole called? There are *salt mines.* A deep hole is dug; many men go down, with pickaxes and spades and barrows. Why are these things needed? They are busy, and work hard in the dark mine with the light of candles. The salt is brought up from the mine as the coal is.

iii. **In salt springs.**—In some places there are *salt-water springs*. The water is caught and dried away, leaving the salt as from the sea-water. In some lands there are *hills* and *rocks* of salt. Salt is needed everywhere, and it is found almost everywhere.

Recapitulate by the help of the blackboard sketch, which should be printed on the board as the lesson goes on.

BLACKBOARD SKETCH.*

SALT.

WHITE—SPARKLING—in GRAINS.
MELTS in fire—DISSOLVES in water.
USES—EATING, PRESERVING, GLAZING.
SOURCES—SEA, MINES, SPRINGS.

GLASS.

(*Provide specimens of glass of various sorts; window glass, plate glass, glass tubes, etc.; also various common glass articles, tumblers, wine-glasses, bottles, ornaments, etc., as* used in school, at home, etc.)

I. **What Glass is used for.**—1. Let the class name all the different glass articles *used in the house*, with a slight description of each: thus (showing tumbler), What is this called? what is the use of it? its shape? parts? other glass things used for drinking from? *Wine-glass*, *glass cup*, etc. Their various shapes, and parts? Other glass things used at the dinner-table? *Salt-cellar*, *vinegar cruet*, etc.: *decanter*, its use? shape? the stopper? etc. *Bottles*, the various kinds? and uses? The *black* bottle-glass, bottles for medicine, soda-water, smelling-bottles; the different shapes? thicknesses? colour? Glass *lamps*, *globes*, etc. *Shades* for covering things, etc.

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* Blackboard sketches should be written as the words occur during the lesson, or as a revision exercise. Such a sketch, for infants' lessons, should be in print letters, or very plainly written, and consist of few words, which should suggest the main points in the order in which named.

2. Glass for *windows*, *picture-frames*, *looking-glasses*, etc.; the *watch glass*, the glass in *shop fronts*, *street lamps*, etc.

3. Glass used for working with, *tubes*, *glass pipes*, etc. Their shape? Why are they used? Water, gases, and other things pass through.

4. The *school thermometer;* the gardener's *frames*. How, and why, used? *Filters*, *spectacles*, *lenses; buttons*, *marbles*, etc.

II. **Why Glass is used** (*i.e. the qualities of glass*).—Let it be *touched*, *looked through*, *handled*, *broken*. In this way, illustrate that *glass is smooth*, *bright*, *brittle*, *heavy*, *hard*.* What do we now know about glass? *It is hard.* What else? *It can be broken.* There is one word which means these two things—being hard, and breaking without bending. Such things are said to be *brittle*. Let all repeat the word. What two things are meant by it? Name something which is not hard but which will break—*Paper*, *cotton thread*, etc. Something which is hard but will bend—*Lead*, *a cane*, etc. Name other brittle things—*Sealing-wax*, *biscuit*, *dry twigs*, etc. Why is glass said to be brittle? Glass can be seen through, can be easily cleaned, will not let water or air through. Which of these qualities make it useful for drinking vessels? for windows? shop fronts? carriages? etc.; for picture-frames? glass shades? lamps? globes? No house is without it; it is used in the school, the workshop, railway carriages, ships, etc. It is *common*, *cheap*, *very useful*.

Glass may be melted.—If convenient, melt a thin bit of glass or bit of tubing in the gas-flame. What other hard things may be melted? *Glass may be cut.* Explain how. If possible, illustrate this. The hard, sharp diamond makes a clear kind of scratch in the glass, then by bending it, the glass is cut through. Show how by this it may be got of any *shape* or *size*. Bring clearly out how its *qualities*—hardness, smoothness, clearness, brightness, ease with which cleaned, cut, shaped in making, transparency, etc., fit it for many purposes of *use*, *ornament*, etc.

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* In all such cases, as each quality is illustrated and clearly understood, give its name; let it be clearly pronounced by all; ask its meaning. If an unusual word, and the children be old enough to read, let it be printed on the blackboard. New words should be used in other lessons as opportunity arises.

III. **Kinds of Glass.**—The same specimens will illustrate most of these. *Flint glass*, the pure, bright, best sort, used for ornaments, lenses, best drinking vessels, vases, etc.; *plate-glass*, for large panes for windows, looking-glasses, etc.; common *window glass*, for houses, lamps, picture-frames, etc. *Bottle glass*, coarser, dark, even black. *Coloured glass*—uses to which put; its prettiness; the *stained glass* of which the fine church windows are made. Some day we may learn *how glass* is made; the different things used for this, the change made in them by melting in hot fires, etc.

Revision after each separate section, and also at the end of the lesson.

SPONGE.

PLAN—I. GENERAL DESCRIPTION AND QUALITIES—II. USES—III. SOURCES.

(*Show specimens of sponges—dry and moist.*)

I. Here is a piece of sponge. Let us learn—

1. **What the eye tells about it.**—Its *shape?* *Roundish.* It is full of holes, some very small, others larger—these are called *pores.* What other things have pores? *Coral;* the *cut end* of a cane; so has our skin, and the leaves of trees, though these are very small. Its *size?* Different in various pieces; sponges *grow*, so some are very small, not larger than a *pea*, others big as a man's head, and some are found much larger still. Its *colour?* *Brown*, or *yellowish.* Put a dry piece in a basin of water. It *floats.* Why is this? Press it under the water. Something rises to the top of the water. What is it? What are bubbles made of? Where does the air come from? What is driving the air out of the sponge? What happens to the sponge? Take it out of the water: how large it is. What makes it so large? Squeeze it, the water runs out: put it now on the water—it runs quickly in again. The sponge *sucks it up;* we say it *absorbs* water.

2. **What the hand tells.**—Touch it: it is rather hard and rough when dry; very soft and smooth when wet. Lift it: how *light* it is. Squeeze it, it may be pressed close together and made small; open the hand, it spreads out large and wide again. Because of this we say it is *elastic.* Name other elastic things. *Cane*, *whalebone*, *steel springs*, *indiarubber.* How these differ from sponges: sponges may be squeezed up small, and will then get large again; these may be bent, and then spring quickly straight again. It is *tough*, what does that mean? It will last a long time.

Say now what we have learnt about sponge. The eye shows that sponge is *roundish*, of *different sizes*, *brown*, full of pores, *i.e. porous;* on water it *floats* when dry; its pores suck up, or *absorb* water, which drives out the air, and makes the sponge swell to a large size.

By the hand we learn that it is *rough* and *hard* when dry; *soft* and *smooth* when wet; *light*, *elastic.*

II. **What Sponge is used for.**—What is it used for at home? Chiefly for *washing* things that must not be scratched. Name some of these—little baby brother or sister, polished furniture, picture frames, painted parts of carriages, etc. Doctors and nurses use it, too, for washing cuts and sore places.

It is so soft, it will not hurt even little baby's face, or the skin, when tender through sores or wounds; it leaves no little bits of itself as flannel does. Doctors use it much for the help and comfort of those who are hurt or sick. It does not scratch or roughen what is rubbed with it, so it is used for washing polished *furniture*, *pictures*, richly painted *carriages*, and for *cleaning many things*. Then, too, dirty water may be partly cleaned by passing through it. Explain *filtering*—water passes through the sponge, leaving behind the matter which cannot get through.

III. **Where Sponge comes from.**—What *is* sponge? It was once the home of many living creatures. They have soft bodies, and live in the *pores* of the sponge, which grows out of their bodies, as the shell of a snail does. But where? *In the sea;* down far and deep, under the waters, *fastened to the rocks* and great stones which lie there. As the living creatures within grow larger, they make the covering of sponge, which grows also. Coral, too, is made in this way, though so hard and firm. Bees live many together, as the sponge creatures do, and make their own little houses too. What are they made of? But the sponge animals cannot fly or creep out as the bees can.

How is Sponge got? Sometimes men go down into the water. They are called *divers*. Describe the strange kind of dress in which they can breathe; how they work for a time in the sea; how they tear off the pieces of sponge and bring them up. At other times they throw down heavy pieces of iron, with hooks upon them, dragged by a rope, which tear off the sponges from the rocks. They are then washed and cleaned ready to be sold for use.

(*Revision.*)

BLACKBOARD SKETCH.

SPONGE is { light, soft, porous,
elastic, absorbs water.

USES—Washing skin, sores, carriages, etc.

WHERE GOT—Grows on rocks in sea.

HOW GOT—by divers.

A LUMP OF COAL.

I. **Description**.—Show a lump of coal. Refer to, and illustrate, its common *qualities*. What is it? How do we know it is coal? We tell this by its *colour* and general *form*. It is black, hard, easily broken. What name is given to things which are hard, yet easily broken? *Coal then is brittle.* Name other brittle things. *Coal is heavy*, some of it *bright*, other coal *dull*. It blackens the fingers when touched. Where is coal got? *It is dug out of the earth.* What are such things called? *Coal is a mineral.* What happens to coal when put upon the fire? *Coal burns easily.* Watch it when put upon the fire. What comes out of it at first? *Coal gives out smoke when burning.* What comes afterwards? *A bright flame.* What is it that blazes in the coal? Explain that this is really *gas. The gas we burn comes from coal.* It is caught as it comes from the coal, before being burnt, and is brought through pipes to our houses. (*Revise these several points carefully.*)

II. **The Uses of Coal.**—These to be got as far as possible from the children.

1. **Its common uses at home.** Where, and how, is coal used in the house? Why do we want fires? *For making us warm. For cooking our food. For boiling water. Used for washing, for scrubbing and cleaning things with, and for other purposes.*

2. **For making steam.** Refer to the railway-engine; the great fire in it. Why so used? *To turn water into steam.* Speak of it as used in other engines. The engines of steam-ships, the engines used for many kinds of work, in factories, workshops, and other places.

3. **For other kinds of work.** *Melting metals*, as used by the blacksmith, and in many other trades.

4. **For making gas.** Coal is shut up in large iron boxes, and made hot, so it cannot burn in a flame. The gas comes out, and is made to pass through an iron tube. With the gas comes out *coal tar.* What is left of the coal when the gas and tar have been taken out? It is then called coke. Compare a lump of coke with the lump of coal What has been taken out of the lump of coal? Will the coke burn? Yes, but no flame comes from it. It turns red. When burnt away what is left? Name all the things which come from coal when burnt? *Smoke, gas, tar, coke, cinders, ashes.* But while burning what comes from it? *Heat.* What is the heat? Heat is that which makes us warm. Can we see it? Can we feel it? Of what use is gas? *We get light and heat from coal.*

III. **Where Coal comes from.**—It is dug out of the earth. Describe briefly the coalpit. The great hole made in the ground, the rocks of coal deep down in the ground, the men and boys who work there. How from the long dark galleries below, the coal is dug out and brought up to the surface. The great quantity got. The many people working busily at it day by day, etc.

(*Revision.*)

BLACKBOARD SKETCH.

COAL { *is a mineral,*
burns with smoke and flame.

Used to { *cook—make steam—*
melt things—make gas—
give light and heat.

From it { *Gas, Smoke, Coke,*
Cinders, Ashes.

COAL IS DUG OUT OF THE EARTH.

A COCOA-NUT.

(*Illustrate with cocoa-nut as commonly sold, as it grows, and as cut open; picture of palm-tree, specimens of other nuts.*)

I. General Description.—Show a cocoa-nut as commonly sold. Its *shape*, *roundish* or *egg-shaped*, its *covering* of *long, thin, brown threads* = fibres; below them the *shell.* Press it, it is *hard*; lift it, it is *heavy*; shake it, there is a sound as though water were inside. This *nut* has an *outside coat.* Show the *outer skin*, *thin*, *smooth*, *tough*, *parchment-like*; the thick lining of *fibres* like those on the nut—how snugly the nut lies in it! Show the *inside* of the nut; the *kernel* lining the shell, *thick*, *firm*, *sweet*, filled with milky juice, pleasant to eat; inside it is the *milk*, *thin*, *watery*, *sweet*. It is the *fruit of a* *tree;* it is *the largest nut* that grows. Why is it called a nut? Name other nuts. Refer to the different coverings and shapes of these: the leafy covering of the *hazel nut;* the thick, green, tough coat of the *chestnut;* the prickly coat of the *horse-chestnut*, etc. Name now—

The Parts of the cocoa-nut. 1. The *outer coat.* What kind of skin has it? It is *green* when growing, *brown* when ripe. 2. The *thick lining of fibres.* What are fibres? 3. The *shell.* What have we learnt about it? See the *three small holes* at the larger end of the nut. The hard shell may be cracked by hard blows of a hammer. Inside is, 4. The *kernel.* Say what you know about it. The kernel forms inside it a hollow sort of cup. What does this cup hold? We must next learn—

II. **How the Cocoa-nut is used.**—1. For *food and drink.* What part is used for this? It is much used in the lands where it grows. The sun there shines down hot and strong. How sweet and pleasant, and good, too, the cool milk is! 2. The *fibres*, picked to pieces, woven into *ropes*, *mats*, *sails*, or made into *brushes*, and many other things. 3. The hard *shell*, made smooth and polished, carved in pretty ways—cut in two it makes pretty *cups* and *ornaments*, and many things. 4. The *kernel* is squeezed and pressed, and out of it is got *oil*, for *burning* in lamps, or making *candles*, or it is used in other ways.

III. **How the Cocoa-nut grows.**—It is the fruit of a palm-tree. None grow in this land. Why is that? Describe the tall, straight *stem;* the great spreading *leaves* at the top; their beauty; the fine *shade* they make; the great bunch of *cocoa-nuts* at the very top, like a great cluster of green apples when young, but growing large and brown when ripe, each one hanging down from a long stem; the pretty look of the grove of palm trees, etc. (*Show picture of the palm-tree.*) But what do these palm-trees grow from? From the cocoa-nut, for *it is a great seed.* When buried in the earth, tiny *roots* push out through the holes in the shell; they grow down large and deep in the earth. The shell bursts open, and from it springs up a tiny plant, which grows into the great palm-tree. There are many in all hot countries. With the trunks boats are made, houses are built, the leaves cover them for a roof. So every part of this grand tree is of use.

(*Revision.*)

What is the cocoa-nut? *The fruit of a tree.* On what tree does it grow? In what kind of country? What sort of tree is it? What use is made of the trunk? Of the leaves? Of the nut? What is the inside of a nut called? What has the cocoa-nut inside it which other nuts have not? What kind of shell has it? What is the shell covered with? *A lot of thin strings.* What name is given to the stringy part? What are the fibres covered with? Name the three coverings, etc. (The easier questions may be answered collectively; the more difficult, individually.)

BLACKBOARD SKETCH.

COCOA-NUT—Fruit of Palm-tree.

I. PARTS. II. USES.

1. Skin = Covering.

2. Fibres = Ropes, mats, brushes.

3. Shell = Cups, ornaments.

4. Kernel = { for eating,
oil for burning

III. PALM TREES { grow from nuts,
give shade,
make boats and houses.

AN APPLE.

General Description. — Show an apple — its name? What is an apple? *An apple is the fruit of a tree.* Speak of size, form, colour, etc. Its commonness, often seen and liked, why? Let us first learn what the *eye* teaches about the outside. Its shape?—*round*, something like a ball; *smooth*;

its *colour?*—*green*, *red*, *brown*, or *yellow*. The three **Parts**, the *apple;* at one end, a *stem;* its use? at the other, a small bunch of very little *leaves*, withered; on some apples we may count *five;* we may call it the *eye*. Number of parts?—*three*. Names?—*stem*, *apple*, *eye*. What does the hand tell about the apple? Feel it: *smooth*, *heavy*. Squeeze it: we cannot crush it as an *orange*, nor break it as an *egg*, yet not hard as a *stone*, or piece of *wood*. We call it *firm*. It has a pleasant—*smell*.

Let us look now at the *inside*. (*Cut the apple across, point out the several parts, as named. Sketch the outline of the section on the blackboard.*) We see, *rind*, *pulp*, *core*, *pips*, four parts.

1. The *rind*, a thin *skin*. Cut off a piece—another word for this?—*paring*. Use of rind? We may know this by seeing what happens when the rind is taken off. The pulp changes colour, loses its nice taste, soon gets rotten. Then the skin keeps the apple sound and good—one word for this?—*preserves* it.

2. The *pulp* is the part we eat. As we cut it, the knife is wet—this is caused by *juice*. Taste it, sweet? sour? the pulp tastes like this too,—how nice to eat! Inside the pulp is—

3. The *core*, made of substance as *thin* as paper, but *tough*, leather-like, in small pieces, joined at edges, forms small, hollow places. Count them, there are *five;* inside are the—

4. *Pips*, one in each little hollow. These are the *seeds*. How many altogether? An apple has *five seeds*. The *rind*, the *pulp*, the *core*, all help to *keep safe*, *protect*, the seeds.

(*Revise by brisk questioning.*)

We must now learn what the apple comes from, or **how it grows**. The trees grow in this country - there are many - the place is?—a *garden*, or many planted together, then called an?—*orchard*. Describe the pretty sight, in spring, the white *flowers*—*blossoms*, tipped with red, covering the trees; their quick going away, falling like snowflakes. What is left?—a little hard green knob, where the blossom was: it grows larger, swelling through the summer into an apple. In autumn it ripens—the colour changes, the pretty look then of the *green*, or *red*, or *golden-coloured fruit.* The pleasant gathering, how the men reach them by ladders in the trees; the careful *picking*, packed in baskets, stored in the fruit-house, or sent t *market*, and sold in shops.

The Use of the apple. Little children soon learn this. They are *nice* to eat, and good for *food.* They help to make us strong and well. Some things we eat are *pleasant*, but not good. Some things are *good*, but *not pleasant.* The apple is both; we call it *wholesome.* How are apples eaten? Sometimes raw, just as picked from the tree. When ripe this is well. What other fruits are eaten in this way? Sometimes cooked, how? *Pies*, *roasted*, *preserves*, etc. So many apples grow, and in so many parts, that they are sold for *little money* —they are?—*cheap.* So even poor people may have this nice and good fruit. Many are sent in ships, from lands where they grow, to other lands.

(*Revision.*)

BLACKBOARD SKETCH.

APPLE.—FRUIT OF TREE.

I. PARTS—stem—apple—eye.
  RIND—preserves.
  PULP—juicy: to eat.
  CORE—keeps pips.
  PIPS—5—seeds.

II. HOW IT GROWS.
  SPRING—blossoms.
  SUMMER—apple.
  AUTUMN—ripens.

III. USE.—FOOD, nice, wholesome.

LEATHER.

(*Materials to be shown during the course of the lesson.—Specimens of various sorts of leather; leather articles, as bags, straps, purse, book covers, etc.; oak bark, skin of rabbit or hare.*)

Introduction.—Ask for some of the uses of leather, and common things made of it, seen by the children daily: *bags, straps, harness, boots* and *shoes;* covers of *books, chairs, writing-desks,* etc. Why is it used for these things? What makes it so useful? Because of its—

I. **Qualities.**—Show by specimens that, it *bends easily,* i.e. *flexible,* and is *strong; things* which *bend,* but are *strong,* are called *tough*; is *smooth, soft, coloured, thin,* or *stout, will hold water;* it will *last a long time,* is *durable.* Let all name these *qualities,* and some give the meanings of the different words; contrast leather with paper, glass, a sheet of tin, thin board, cloth, etc. Now we must learn—

II. **How Leather is made.**—What is leather? *Paper* is made of *torn-up rags; tin* is *dug from the earth,* and *hammered* thin; *calico* and *cloth* are made of *threads* woven together. Leather is unlike all these: it is made of the *skin of an animal.* Show a piece of leather, and the skin of a rabbit; point out the differences. *Leather* smooth, even, tough: *skin,* hairy or with fur, soft, moist (if fresh), dry, stiff (if old). Skin put aside when taken off becomes rotten and will *perish;* if dried as it is, it gets *hard* and stiff, it will *crack,* and could not be used. What is done to change *skin* into leather? It must be—

1. **Tanned.** How is this done?

First, the skin is stretched on flat boards and scraped, to get off the bits of fat and flesh. Why should these be taken away? What else must be got rid of? To do this—

Second, it is soaked in *lime and water:* so the hair is loosened and can be *scraped off.* But what is done to make it tough and lasting? This is done by—

Third, the *Tanning.* Describe the *tan-pit:* a large, deepish hole in the ground, holding *water* and crumbled *oak-bark,* in which the skins are soaked. In the bark is something which tastes bitter, and 'nips' or stings the tongue, as mustard does. It is *soaked out* in the water (illustrate by 'making tea').

This gets into the skin and *changes it into leather.* But this change takes a long time. The skins lie in the tan-pit many, many weeks. When ready they are taken out and *dried.* But they are now rough and uneven. To smooth them and make them firm, they are *pressed,* by passing between rollers. (Illustrate by the *mangling* of clothes, in this way.) The workman who does all this is called a *tanner.*

(*Revision.*)—What is leather made of? Difference between skin and leather? What will become of skin if not changed into leather? What must be done to change it? What are the three chief parts of this work? Why is skin scraped? Why soaked in lime-water? What is tanning? What is a tan-pit? What is used for tanning? What is done after the tanning? Why? etc. etc.

But even yet the leather is not quite ready. Look at a piece of finished leather. How *smooth* and *even* it is; how *black,* or nicely *coloured.* It can be *made to shine;* so our boots are *polished.* To do all this, after *tanning* it must be—

2. **Curried.** From the *tanner* it goes to the *currier.* What is his work? With a large, sharp, strange-looking knife he *pares* the leather, taking off all the rough, uneven parts. He rubs it with oil and grease, and spreads over one side of it a kind of black, greasy powder, called *lampblack.* What does that do to the leather? Then with more *rubbing,* and *oiling,* and *pressing,* and *drying,* he makes the *finished leather.* Compare thin *upper* leather with thick *sole* leather. The first from skin of *calf;* the other from that of *ox* or *horse.*

(*Revision.*)—The two kinds of work to be done? The names given to the workmen? The tanner's work? The currier's? What each uses? What change is made by each? etc. etc.

Let us next learn some different—

III. **Kinds of Leather.**

1. *Common leather,* for boots shoes, straps, harness, etc. From skin of *calf, ox,* or *horse.*
2. *Morocco leather,* thin, soft, prettily coloured, and marked. From skin of *goat.*
3. *Kid leather,* thin, soft; will stretch; how coloured; for *gloves.* From young *goat* (*kid*) or *lamb.*

4. *Wash, or Chamois leather*, from skin of chamois, a kind of *deer*, which lives on the high hills of some foreign lands; or from *sheep skins* worked in a special way.

IV. **Uses of Leather.** — (These may be got mainly by questions, and references to the many things made of leather, seen in daily life.) For *clothing: boots* and *shoes;* refer to the great quantity used for the thousands of men, women, and children in many lands. How *strong* it is to last so well; how *easy* for wear; how *dry* and *comfortable* it keeps the feet. *Gloves*, *cap-fronts*, *leggings*, etc. For *purses*, *bags*, *book-covers*, etc. For *furniture;* covers of *chairs*, *couches*, *carriage seats* and *sides.* For *harness*, *straps*, *reins*, *whips*, etc. For *cleaning glass*, *silver*, *carriages*, etc. The different *kinds* of leather used for these various purposes, because of different qualities needed, etc.

BLACKBOARD SKETCH.

(For the elder children.)

LEATHER—made of skins of animals.

Flexible, strong, tough, smooth, holds water.

TANNED = scraped, soaked with oak-bark in water, pressed.

CURRIED = pared, oiled, rubbed, dried.

KINDS.	*SKIN OF*	*USES.*
Common	*—Cow, Horse:*	*straps, shoes, bags, harness.*
Morocco	*—Goat:*	*covers of books, desks, etc.*
Kid	*—Kid, Lamb:*	*gloves, purses, slippers.*
Wash	*—Chamois, Sheep*	*cleaning silver, glass, etc.*

This lesson may be conveniently divided into two; the second to begin with a good revision of the first.

PAPER.

I. **Introduction.**—Show specimens of several sorts of paper, describing each in general terms. Ask what they *see* of its qualities, and *know* of uses, etc. Some *clean*, *white*, *smooth*, etc., for *writing*. Large sheets, *white*, *thin*, for *newspapers*, etc.; another sort, *stiff*, *strong*, *brown*, for *parcels;* other pieces, *soft*, *thin*, *blue*, *red*, *white*, etc., for flowers, ornaments, etc. Interest the class by referring to some of the many *uses* seen, day by day, at *home*, at *school*, in *shops*, etc.

II. **Qualities and Kinds.**—Why is paper so useful? Because of what it *is*. Show and decide its *common* qualities. All paper is *thin*, *flat*, easily *folded*, *crushed*, *cut*, etc. When wetted, it becomes weak, rotten, easily broken to pieces: when dry, it is easily set on fire.* Place pieces against window to show, by different sorts, light is kept out or can pass through. Show *why* this is.

There are different **kinds** of paper. Let the children help in arranging the specimens into different sorts.

1. **Wrapping Paper:** *Brown*, which is *stout*, *strong*, *coarse*, may be bent or folded, not easily broken—*tough*.

2. **Writing or Printing Papers:** *White*, which is *thin*, *smooth*, some *shiny*, some *dull.* Note the marks, letters, figures *in* the paper. Compare the several sorts for *writing*, or *printing*, etc.

3. **Fancy or Tissue Paper:** *Tissue*, very *thin*, *soft*, *easily broken:* its pretty colours; how *light* and delicate it is.

4. **Blotting Paper:** *Blotting*, white or coloured, *soft*, *thickish*, *dull*, etc. Show how easily ink or water *runs into it* from table or slate, or even from paper.

5. **Drawing Papers:** Show cartridge paper, the large,

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* **Let each property or quality be illustrated and made thoroughly clear to the class; then let the right name or descriptive word be applied and reproduced.**

stout, handsome sheets; the stout, smooth, stiff millboard, Bristol board, etc. Why called boards?

(*Revise by questions both collective and individual.*)

III. **Uses.**—Speak of *errands* of various sorts to shops. The grocer, draper, baker, etc. The many sorts of things wrapped in paper. The different kinds used for different things. The strong *brown* paper for heavy parcels, the *thin* paper bags for flour, the *coarser* for sugar; *why* the different kinds are used; the *qualities* which fit it for its special use, etc.

The uses for *writing* and *printing*. The smooth, nicely-cut small sheets for *letters*; the large, thin sheets for *newspapers*; the stouter sort for *books*.

Blotting Paper.—*How* and *when* to use it, and *why*.

The pretty *ornaments*, *flowers*, etc., made of *tissue paper*. *Wall paper:* describe the *comfort* and *neatness*, and *pretty look* which it gives to the room.

(*Revision.*)

IV. **Making of Paper.**—Where does it come from? It is *made*—of *what?* and *how?* Show a handful of *dirty rags*, *bits of rope*, *straws*, etc. From such as this is made the clean, white, smooth paper. Contrast these materials with the paper. How strange the difference. What is done to bring it about? First, the rags are—

Sorted.—Different kinds put by themselves; the *thin* and *soft*, the *coarse* and *coloured*, the ends of *rope*, etc., for different sorts of paper.

Then **cleaned**; the dust is *shaken* out, the rags are *washed*, even *boiled*, and made *white*.

Next, **torn** to tiny bits, in water—it now looks like thick milk, or flour and water stirred together. It is called **pulp.** Illustrate by soaking a little blotting sheet in water to show *pulp*.

Name the three kinds of work done before pulp is made. *Sorting*, *Tearing*, *Cleaning*. But how is pulp changed to paper? First it is made *sticky*, by having melted gum or glue mixed with it. Then it is spread out *flat* and made *dry*. (Illustrate by referring to making thin sheet of paste for pie-crust.) The pulp is poured out on large, flat, wire sheets put into frames. (Illustrate by slate frame.) What will become of the water? As it dries it holds together, and is a *sheet of paper!* It is then *pressed*, and made smooth and even. Look again at the rags and the paper.

Brown paper is made of the coarsest rags, and the ends of rope, and other like things.

V. **Recapitulation,** specially of uses.—What should we do without paper? Things sent home from shops in paper of many different kinds. Books, newspapers, letters, covering of walls, all need paper.

Sometimes the *pulp*, instead of being spread out *thin*, is left thicker and dried—or sheets of paper are pasted one over the other—this makes *cardboard*—(show cards). It can be made so *thick* and *hard* and *strong* as to be like thin wood, but lighter; and so *trays*, and *boxes*, and book-covers, and many such things are made.

Speak of the many persons employed in the work of paper-making, from the poor *ragpicker* to the *folder* and *packer*.

BLACKBOARD SKETCH.

(*To be written as the words occur during the lesson.*)

PAPER.

I. KINDS.	*II. QUALITIES.*	*III. USES.*
BROWN—	*Strong, coarse:*	*for Parcels.*
WHITE—	*Thin, smooth:*	*,, Writing, Books.*
TISSUE—	*Soft, coloured:*	*,, Ornaments.*

IV. MADE
of rags, rope, straw.
by sorting, tearing, cleaning.
into Pulp; *pressed = Paper*

This lesson may be conveniently divided into two: the first to end with Section III., the second consisting of Sections IV. and V., preceded by a recapitulation of the first lesson.

CUPS AND SAUCERS.

(*Materials requisite are named in the course of the lesson.*)

I. **Introduction.**—Show a cup and saucer. Direct attention to general form, appearance, and parts. Interest all by pleasant reference to the uses at home, etc., questioning freely, and specially requiring the whole class to repeat the good individual answers obtained. Both cup and saucer are *smooth*, *hard*, *white*, or *coloured;* look at the pretty marks, or pictures, etc., upon them. Though hard, they are easily broken. (Illustrate by breaking a piece of broken crockery.) It is called *brittle.* Repeat the meaning—*brittle*, because hard and easily broken. Name other brittle things—*Glass*, *biscuit*, *slate*, etc.

The cup is round, deep, has a handle, rim or edge, etc. The saucer, round, flat, not deep, is wide. Recapitulate the likenesses and differences, etc.

II. **What made of.**—Cups and saucers *are made:* they are not like leaves, or fruits of plants, which *grow;* nor like flints, corals, etc., which are found just as we see them. We have two things to learn—(1) *What* they are made of; (2) *How* they are made. The cup is *hard*, but is made of what was *soft.* Refer for illustration to other *known* things: as *crust* of bread from *dough; pie-crust* from *paste*, *brick* from *clay.* So cups and saucers are made from *soft clay.* Show clay, a hard lump, and a piece softened by water; it can be easily shaped in any way. But cups made of clay alone would not be *strong.* It is mixed with *powdered flint.* Show a piece of flint; it is ground to tiny bits, as we could crush a bit of chalk, and mixed with the clay in water. The flint makes it strong, hard, white, and nice looking.

(*Recapitulate.*)—Of what two things is the cup made? What is done to the clay? to flint? Why is flint mixed with clay? etc.

Let us now learn—

III. **How the Cup is made.**—The workman takes a lump of clay, and shapes it with his hands. (Show how, with a lump of soft clay.) He is helped by its being made to turn quickly round while he shapes it. Describe briefly the round, flat table made to turn round by a cord passing over a wheel. Speak of the cleverness of the workman, learning when young, and doing it every day. But when the cup is made it is but soft clay; it would soon get out of shape, would hold no water, etc. It must be *made hard.* How is this done? Show again the hard and the soft clay. What makes the difference? To harden the clay, what must be got out of it? Refer to the mud on wet days, and the hard, dry heap when the sun has shone upon it. Refer also to previous lessons, to show clearly how heat *drives away water*, or *dries it up.* The soft clay cup is *put into an oven.* What happens to it there? When well baked it is? *hard*—as the paste is baked into? *pie-crust*, and the dough into? *bread.* But the cup is not yet ready for use. It is dull, rough, not pleasant to drink from, nor easily cleaned. (Show specimen of unglazed pottery, or a clay pipe, or common flower-pot.) It must now be made *smooth*, and *shining*, and *pretty*, and must have the *coloured pattern* on it. The marks and pictures are printed in coloured ink, on thin paper, and laid on the rough cup; the ink runs into it, leaving the pictured mark, and the paper is then pulled off. To make it smooth, the cup is dipped in water that has salt, and ground flint, and other things in it, and is then put again into a hot oven and baked once more. When finished it is covered with a thin glaze-like covering, and it is said to be *glazed.* Here is our pretty, useful, cup and saucer.

(*Revise as before.*)

But we must know something about—

IV. **How to use it.**—Speak of *when*, at *breakfast* and on the *tea*-table. The use of the *cup.* How to hold it. What if the cup of hot tea is lifted without the handle! The use of the *saucer.* Why put under the cup. Speak of the good of cleanly, nice ways at table, etc. Then we must not forget that they are *brittle*, and so, *easily broken.* How they must be *handled*, and *carried*, etc. Whenever used they must be *washed*, and put away in their proper places. See how *carefully* mother does the *washing*, *wiping*, *packing*, etc.

(*Revision.*)

Special words and heads may be written, as judged best by the teacher, in the

BLACKBOARD SKETCH.

CUPS AND SAUCERS.

CUP—Round, deep; has handle, rim.
SAUCER—Round, flat; has rim.
Both are smooth, shiny, hard, brittle.
MADE of soft clay, flint.
" by shaping, baking, glazing.
USED to hold Tea, Milk.

THEY MUST BE USED WITH CARE.

THE COMMON COINS.

I. General Description.—*Show* specimens of the several coins. Ask for the names of each in turn. *Penny, farthing, shilling, sixpence,* etc. Each separate sort has its own name. But there is one word which means any one of them, or *all of them together.* What is the word? *They are called money.* They have the *same name.* Are they all alike? Different answers will be given to this question. Some of the children notice that the *coins are alike;* others notice that the *coins differ.* Both are right. How is that? Coins are alike in some things; they are different in other things. Let us notice—

1. **In what Coins are alike.**—They are alike in *shape.* They have a *round edge,* and *two flat sides;* they are all *thin.* What are they made of? All are *made of metal.* On one side all are marked in the same way. What is the mark upon them all? Whose are the head and face that are figured there? What other marks have they all? All have letters, etc.

2. **In what Coins are different.**—They differ in *colour*, in *size*, in the *kind of metal* they are made of, in some of the *words* and *letters* on them, and *how much they are worth*, etc.

(*Revise these several points.*)

II. **Differences in the worth of Coins** (*i.e. values of coins*).—What makes the differences? Bring clearly out that part of the difference is because of the *different kinds of metal;* part is because of the *difference of size.*

1. **The different kinds of metal.**—How are these differences known? Chiefly by *the colour.* How many different colours? Put the bright yellow coin by itself; the white coin by itself; the dark brown coins by themselves. The name of each. Take a *penny.* Interest the children by asking them to name the many different things which may be bought for a penny: a bun, two oranges, a postage stamp, a little book, a bottle of ink, a small loaf of bread, etc. Take a *sixpence.* Compare as to *size.* What is it called? What does the name mean? How many postage stamps, little books, buns, bottles of ink, etc., will it buy? Why is this? Because *the sixpence is worth six pennies.* Why is it worth so much more? Because silver is worth so much more than *bronze* or *copper.* Next compare the penny with a half-crown. Both are nearly of the same size. Yet the *half-crown* is worth *thirty pennies.* Illustrate this as before. With the half-crown we may buy thirty penny postage stamps, thirty penny books, or buns, etc.

In like manner compare a shilling with a half-sovereign. Bring out the number of shillings one sovereign is worth. Yet they are of nearly equal size. What makes the difference? Compare other coins with each other—a farthing with a sixpence, with a half-sovereign, a penny with a sovereign, and so on. Make plain the point that because of the difference in the value of the metals there is difference in the value of the coins. Which metal, size for size, is worth most? Which is worth least?

2. **The difference in the sizes of the Coins.**—Compare together a farthing, a halfpenny, a penny. What can be bought with each? How many farthing apples or marbles can be bought for a halfpenny? for a penny? How many farthing marbles for a halfpenny? How many halfpenny buns for a penny? and so on. In a similar way deal with a threepenny piece, a **six-**

pence, a shilling, and a half-crown. All are of silver, yet one is worth two, or four, or ten of the threepenny bits. Why this is; what this teaches about their *relative values*. Why are coins of the same kind of metal different in values? Why do coins of different kinds of metal differ in value? etc.

(*Recapitulate.*)

A BOOK.

(*Let each child have a book, all being similar in size, shape, and general arrangement.*)

I. **A Book.**—First examine it generally. Its *shape*. Nearly square. How does it differ from a square? Count its edges, sides, corners. How many of each? The front and top edges are *long* and *narrow*. The back is long and narrow too, but broader than the front edges. It is as *broad as the book is thick;* it is roundish too, and all in one piece. The sides are flat. On them and the back are markings, and (probably) letters. So with the colour—the book *looks pretty*. The edges of the leaves are *white*, or *gilded*, or *coloured*. (Describe according to specimen.)

II. **The Parts of a Book.**—Two chief parts—the *covers*, the *leaves*. 1. The **covers**. Describe these, illustrating by the book which the children have. These are two, the *front* cover and the *back* cover, joined together by the *back*. They are (usually) stiff and strong. What is their use? They keep the leaves together and *protect* them. What would happen to the leaves if they had no cover? They would soon get dirty and broken. Note that the covers are a little longer than the leaves. They stand out *over the edges* of the leaves. Why is this? Show the convenience and use of the cover, for handling the book, for standing it on a shelf, etc. On the back is printed the *name* or *title* of the book.

2. The **leaves**. What made of? Shape? Colour? How they lie; closely packed on each other. Open the book carefully. The first leaf or two have nothing on them. The rest have letters and words printed on them. Show how the book should be held and handled; how the leaves should be turned over, so as neither to soil nor bend back

the edges nor break them. *The title page.* Where and what this page is. On it is printed the title of the book. What is that? Words which tell what the book is about. Also where it may be bought. But what is a *page?* It is *one side of a leaf.* Each piece of paper is a *leaf.* Each leaf has *two pages.* Carefully and clearly make this plain to all. So each book has twice as many pages as it has leaves. Look at the upper corner of the page. There are figures. What do they show? The *number* of the page. The use of this? Show how, by the number we may easily and quickly find any page. Illustrate this. Interest the class by getting them to find pages as the number is told. In many books pictures are printed as well as words on the pages. Explain why. The value of this to *give pleasure*, and to make plain the reading. *How the book is to be held*, the pages to be turned over, the pages to be found, the way in which the reading is to be followed, from the upper line to the lower on each page, from one page to another; how the book is to be closed, and where and how to be passed or placed away, should be simply and clearly taught and practised.

III. **How Books are made.**—1. The leaves of the book are made of paper. Other lessons have taught us how the beautiful white sheets of paper are made from dirty cast-off rags. A few questions on leading points of the manufacture may be asked. This is the work of the *papermaker.*

2. The covers are made of stiff cardboard, covered cleverly with cloth or leather. These are pressed and marked and printed. The leaves are stitched together at the back edges, and the covers are sewn and pasted on at the back. This is the work of the *bookbinder.*

3. But what is it which makes the *reading?* The *printed letters and words.* Of what are the black letters made? Refer in general but interesting terms to the *metal types*, the *black ink*, the *printing.* This is the work of the *typefounder*, the *inkmaker*, the *printer.*

4. Even this is not all. How does the printer know what words to print? They must have *first been written.* This is the work of the real *bookmaker.* He is called the *writer*, or the *author* of the book.

Recapitulate carefully the names given to the various persons whose work we see *in a printed book.*

BLACKBOARD SKETCH.

A BOOK—Parts { *Cover.*
Leaves.

Cover—Stiff, strong; keeps safe.
Leaf—Two Pages; thin paper for the printing.

BOOKMAKING.

PARTS.	*MAKERS.*
Covers	*by Binder.*
Leaves	*,, Papermaker.*
Printing	*,, Printer.*
Written	*,, Author.*

A CHAIR.

I. **Description of a Chair.**—Show a common chair, such as ordinarily used in schools. Ask a few questions as to its *use*, *convenience*, ease with which it *may be moved* from place to place, etc.; then its *parts*, and their several uses, etc. Thus, What is this called? What is it used for? How many persons can sit easily at one time upon it? What else is used for sitting upon? *Forms*, *stools*, etc. What is the difference between a *form* and a *chair?* One is long, and several can sit upon it at the same time. Which can be most easily moved? Where is the chair generally used? The *form?* Why? Which is the best for use in classes? Which for sitting at table? What is the difference between a chair and a stool? What has the chair which the stool has not? Which can be most easily carried about? Which is the best for grown-up people? Why is this?

The parts of the Chair.—Show each in succession, asking its name, use, relative position, etc. Thus (pointing to each as named), a chair has *back*, *seat*, *legs*. These are the chief parts. The number of *legs?* Why *four?* What if three only? The four legs keep the chair steady. Note *where* they are placed—*one at each corner*. Why there? See how steadily the chair stands; not easily thrown over when used with care.

The seat.—Its shape. Nearly but not quite square. Count its corners and sides. Which is the longer edge? Which the shorter? It *tapers* or gets smaller from front to back. The seat is smooth, sometimes hollowed out a little. Why not quite flat?

The back.—Its shape? How it slopes? And why? It is made of parts. The *sides* and the *rails*. Note their number and shape on the specimen shown. What is the use of the back? What if the chair had none? Show how it adds to comfort, etc. Sometimes there are rails between the legs. Why? They make the chair strong, etc. There are different—

II. **Kinds of Chairs.**—They differ in the *way in* which made, in the *place* where used, in the things of which made, etc.

Kitchen Chairs or school Chairs.—Of what and how made? The wood is smoothed and polished, sometimes coloured. What kind of wood? Always *hard* and *strong*. To the elder children the names of the woods used may be given, and the differences of grain, etc., pointed out. *Beech*, *elm*, *ash*, *birch*, etc., chiefly.

Chairs for parlour or sitting-room.—The wood often different. Usually of mahogany. How smooth, and hard, and bright it is. The seat is made of horse-hair, covered with *leather* or *haircloth*. What difference does this make to the sitting upon it? Look at the *legs;* they are round and prettily shaped; sometimes carved. The back, too, is more prettily made; sides, and rails, and top curved, etc.

Chairs for the bedroom.—These are lighter, though strong; the sides, rails, and legs smaller; the seat often of *cane*. Show how made by interlacing the split strips of cane; the neat, strong seat it makes. Some have seats made of a strong kind of *grass* called *rushes;* these are *rush-bottomed chairs*.

Arm-Chairs and Easy-Chairs.—Why called *arm*-chairs? The use of the arms. Where placed. The greater comfort they give in sitting. *Easy-chairs.* Why so called. Show how seat, back, arms are all covered with leather; stuffed with hair, etc.; how they are carved; slope backwards.

Children's Chairs.—Why so small? What if a little child has to sit on a high chair? Yet some children's chairs are high. When and how used? etc.

(*Recapitulate each point carefully.*)

BLACKBOARD SKETCH.

A CHAIR—For sitting on.
PARTS—Back, seat, legs.
KINDS
- *KITCHEN—Strong.*
- *PARLOUR—Pretty.*
- *BEDROOM—Light.*
- *ARM-CHAIR—Easy.*
- *CHILDREN'S CHAIR—Small.*

Group 2.—Lessons on Animals.

Many of these lessons are very fully detailed, and occupy a correspondingly large space. In almost every case they can be easily divided into two separate lessons at the points indicated in the footnotes.

BEASTS—GENERAL LESSON.*

(*Pictures of the various animals spoken of should be used as the lesson proceeds.*)

I. **Introduce** by speaking of the different kinds of living things we see around us. Some live on the land only; others, sometimes on land, sometimes in the air, or on trees; some are small creeping things, or having through part of their life wings with which to fly about; others, at all times living in water. Names of these? The first kind are called *animals* or *beasts*. Those which fly in the air, as well as living on land, are? *birds*. The small creeping or flying things are? *insects*. Those which live in the water are? *fishes*. How many kinds of living things? How may we know them apart? etc. Let all repeat, 'Beasts live on the land,' 'Fishes live in the water,' 'Insects creep and fly,' 'Birds have feathers and wings, and fly in the air.' We learn to-day about—

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* These general lessons serve the twofold purpose of revising former lessons, and of imparting new information. They should be largely interrogative in form.

II. **Beasts.**—Ask for names of common animals. *Horse*, *sheep*, *dog*, etc. The *largest* they know; the *smallest*. Other *large* animals; other *small* ones. The names of *wild*, of *tame*, of *fierce*, of *gentle*; of those *useful* to man, of those *hurtful*. These are very different in many ways, in *size*, strength, shape, covering, food, ways of living, etc. There is one thing in which all are alike. What is that? All have *four* legs. What, then, are beasts? All repeat the answer, 'Beasts are four-legged animals which live on the land.' How do they differ from fishes? from birds? from insects? Let us now learn the—

III. **Different kinds of Beasts.**—They differ in the way *in which they live*. 1. Some live near men and are useful. These are tame animals. Some are of use for **the work they do.** The horse for? *drawing loads*, or *carrying on his back*. How strong and patient he is. What work does he do? *Drawing carts*, *carriages*, *cabs*, *omnibuses*. Where do we see this done? Another animal that does this? What animals are used instead of these in hot countries? What other useful animals are kept about our homes? What is the use of the cat, the dog? etc.

2. Some are useful because of **what we get from them.** What food have we from a living animal? What animals give us flesh to eat? What is the flesh of the ox? the sheep? the pig? etc. We get part of our clothing from animals. Ask for the different parts of clothing got from cow, sheep, fur-covered animals, etc.

3. **Wild Beasts.**—Some of these are fierce; they catch

other animals. Why? Name some. *Lion*, *tiger*, etc. What animals in this country do so? The *fox*, *otter*, etc. What tame animals do this? These are sometimes called **beasts of prey.** Their prey means the animals they catch. To find their prey they are quick in *sight*, or *hearing*, or *smelling*. To catch it they are quick *to run* and *jump*, and *strong to seize it.* What do they seize their prey with? Their claws and teeth are sharp and strong. Some wild beasts are timid. Name some—rabbit, deer, etc. These also are quick in *sight*, and *smell*, and *hearing*, and *running*. Why do they need to be so quick? How does a mouse get away from the cat? *By running and hiding.* This may help us to know how the deer may escape from the lion, etc.

4. Most animals live *on* the land. What animal lives much in trees? Where does the mouse make its nest? What other animals live in holes in the ground? Rabbit, rat, etc. Some live *partly in the water.* Refer to previous lessons on *beaver*, *otter*, *hippopotamus*, etc.

(*Revision.*) — The simple sentences forming the chief answers to be repeated by all the class.

BLACKBOARD SKETCH.

(*To be written as the lesson proceeds, or during revision.*)

BEASTS—four-legged Animals.

Some Beasts for {
work.
food.
clothing.

Beasts are {
wild or
tame.

Beasts of Prey {
are fierce.
catch other Animals.

THE CAT.

PLAN — I. INTRODUCTION — II. GENERAL DESCRIPTION — III. STRUCTURE—IV. HABITS (food and use)—V. KINDS —REVISION, at the end of each several section.

(*Illustrate the various points, by reference to a picture, or a living cat.*)

I. **Introduction.**—Refer to the cat as seen at home; sometimes quiet, lying on hearthrug, by the fireside, fond of soft, warm places. Sometimes, running, jumping, climbing trees or walls, very *active.* When pleased, she *purrs:* when hungry or in want, she *mews.* The young one is called? *a kitten:* how pretty it is! how *playful* and *active* and *funny* its ways are! The cat lives with us in the house; she goes out and in freely; we say she is *tame.*

Let us now think about—

II. **What kind of Animal the Cat is.**—Look at her as she lies on the rug. Her **body** is long. She bends it quite round, and rolls over and turns in any way, quite easily. What is she covered with? Soft, smooth hair like this is called? *fur.* Touch it, it feels? *soft.* Pass your hand over it, it is quite? *smooth.* How pretty the markings! Name some you have seen—black, grey, striped, spotted, tortoiseshell. What does that mean? The **fur** stands up when she is angry; how large the long, slender tail seems to be then! The **head** is? *round.* How does it differ from a dog's? The **ears** stand straight up. How quickly she moves them! The **eyes** are large and round; sometimes the inner part changes in colour and size. The **mouth** looks small when shut, but how widely she can stretch it when open! See on each side the long straight hairs. What is the hair called which grows on the sides of your father's face? So these are called *whiskers.* Touch one, it bends, but goes straight again directly. When she is quiet we may take the **paw** into our hand. It is soft and warm, and does not hurt us. Is it always so? Where are the sharp claws now? She moves about quickly; jumps on chairs or table, even climbs trees or walls. She is? *active.*

We must not forget the little kitten. How fond she is of play! Catching at anything near her; the edge of the tablecloth; the fringe of a dress; even her own tail! rolling over and over it. Roll a ball towards her. How does she catch it? Pussy catches with? *her claws.* A dog would catch it with? *his mouth.*

(*Revise.*)—Let us see what we have learnt. What two names has the cat? Where is she fond of lying? What are the two sounds she makes? What kind of body has she? Where are the whiskers? How can pussy hide her claws? etc.

But we must now learn more about—

III. **The different Parts.**—Let us begin with the **head.** We shall have to notice, the **eyes,** the **ears,** the **whiskers,** the **teeth.**

1. **The eyes.**—What have we already learnt about them? Turn pussy's face to the light. In the middle is a beautiful round, coloured ring, like that we see in each other's eyes; the part inside this ring is called the *pupil.* Spell it; try to remember this new word. As the light falls on it, the ring closes, so that the pupil gets smaller, looking like a green slit in the middle. As the head turns to the dark side of the room, it grows large again. In the light, then, the pupil is? *small;* in the dark it? *grows larger.*

2. **The ears.**—Where are they placed? They are broad, and open at the bottom; hairs grow on the inside, to keep out dust or flies; they can be moved quickly, to catch sounds on all sides; touch them, how soft and delicate they are!

3. **The whiskers.**—What are they? Touch one, it bends, but goes straight again directly. Pussy winces and shakes her head. Why? *She feels the touch.* So they are called? *feelers.* They grow from little bulbs on the side of the face.

Now we may look inside the mouth, at—

4. **The teeth.**—In front are four, long and sharp, two above, two below: they are bent and strong, like curved nails. With these the cat *catches* and *holds fast.* Between each two of these are four very sharp but *broad,* and *not so long.* They are like the sharp tools carpenters use to cut wood. What are they called? These are like *little chisels.* In the back of the mouth there are strong sharp teeth, by which the cat can *crush*

and *grind* the food. How many kinds of teeth has she? Think of them as we learnt them. The first for? *holding:* the second kind for? *cutting:* the third for? *crushing* and *grinding. Holders, cutters, grinders!* In our mouth there are teeth something like them, and for the same uses too. Try to find them, and name them.

Now a few things to be learnt about—

The body.—Look at it well. What is its shape? How is it covered? What is the difference between *hair* and *fur?* It can easily and quickly? *bend* or *twist.* It is very *strong* too, and can squeeze or force itself through small places. We must not forget the tail! Its shape; how it *tapers;* the cat bends, or *coils* it round its feet when asleep.

The last part we must talk of is—

The foot.—Count first, the *claws.* Can you find them? We can see where they lie, *five* on each front foot, *four* on each hind foot. Do they always lie hid in this way? No, only *when not wanted.* When a ball or a mouse is *to be caught,* they come quickly out; or, when pussy is *angry,* so we must be careful how we treat her. When not in use, they are drawn in, and so kept sharp for? *scratching* and *tearing.* (Illustrate by scissors and sheath, pocket-knife, etc.) On the bottom of the foot are *little pads,* soft and springy, like small flat india-rubber balls. When the cat walks, she steps on these pads, so makes no? *noise.* They help her to *jump,* too, and when she jumps from a height she falls on them, and so is not? *hurt.*

(*Revision.*)—Now for questions again. What are the parts we have talked of? (*Head, body, feet.*) What is the pupil of the eye? When does it grow large? What are the whiskers for? How many kinds of teeth has the cat? What is each kind used for? How many claws has she? Why are they kept in a sheath? etc.

What we have been learning teaches us what kind of creature the cat is; let us now try to learn—

IV. **What the Cat does.**—The best way is to watch her as she does it. While she lies on the rug a scratching sound is heard. Only a little noise in the cupboard, or under the floor, but pussy hears it. In a moment she *starts up,* wide awake. Can she hear where the noise is? Yes, *she can move* *quickly* to catch the sound. She runs *quietly*, but *very quick* to the place. Why is that? What makes the noise? Pussy knows *it is a mouse.*

The eyes are wide open now. They seem to *grow larger* as she looks steadily into the dark cupboard. She tries to get in, but draws her head quickly back again. Why is this? She knows *there is not room* to do it. How does she know this? The long **feelers** on each side touch something; they tell her *she cannot pass.* Now we know *the use* of them. We will open the door for her. She goes quickly in. How softly she steps! Why? How can she do this? Because of the? *soft pads* below her feet. She *turns* and *twists* quietly between the things in the cupboard, but can see nothing. She stands quite still, or lies down, watching keenly, often a long time—she is *patient.* Presently something like a little dark shadow flits past; there is no noise; it passes in a moment. But quicker than it, out goes pussy's paw, the sharp claws all out now! There is a little squeak. What has she caught? So the keen *eye*, the quick *ear*, the padded *foot*, the *quick*, *quiet* movements, the sharp *claws* and *teeth*, have all done their part in? *catching the mouse.* Sometimes it is a *bird* that is caught. Pussy hides under a bush, climbs a tree, springs from a wall, in the same *quiet*, *quick*, *patient*, *clever* way. Sometimes it is even *a rat.* Strong and fierce and cunning as it is, the cat can catch it, and kill it.

We now know something of *what pussy eats*, and of *the use* she is in the house. What else do you see her eating and drinking at home? *Meat*, *milk*, etc. Sometimes she takes these from the cupboard, and gets *blamed* and *beaten.* How can we keep her out of the cupboard? Who should be blamed if she gets in? We should treat pussy *kindly.* To *beat* her, or *throw stones* at her, or *hurt* her, is cruel, and is *wrong* and *sinful.*

(*Revision as before, of the chief points in the last section.*)

We have talked only of cats in our houses, but there are other—

V. **Kinds of Cats.**—As those at home live in the house, we call them **tame.** There are some which live in the woods: they would not stay in a house. These are? **wild.** They are stronger and fiercer, and catch *rabbits*, *birds*, and other *living* *creatures.* In some lands there are other animals like cats, but very *large*, and *fierce*, and *strong.* The *eye*, and *ear*, and *foot*, and *teeth* are like theirs, and are used in the same way. They have different names: other lessons must teach us about them.

(*Revision, covering the main facts of the entire lesson and comprising both individual and collective answers.*)

If necessary, this lesson can be conveniently divided at the end of either section, the second lesson commencing with a review of the previous one.

THE COW.

(*The interest and success of the lesson will depend much upon showing carefully, in addition to the picture of the cow, milk, leather, and other things described as each is referred to.*)

I. **Introduction.**—Speak of *milk* and *butter*, used for breakfast and tea; of *beef* and *cheese* for dinner; of *suet* for puddings; *leather* for shoes, harness, straps, etc.; *horn* for knife-handles; *glue* for fastening wood, etc. Where are these things got? The *farmer*, *butcher*, *shoemaker*, *saddler*, *carpenter* depend on the **cow** for what they need in their work. For much of our *food* and *clothes*, in riding and driving, and in many other ways we make use of what is got from the cow. She is one of the most *useful* of all animals.

(*Obtain as much of this as possible from the class in answer to short, simple, clear questions.*)

II. **Description.**—Let us first learn what *kind of animal* she is. Show picture; ask name again. Describe, by its help, the size, colour, and general appearance; the large *head*, the great *body*, the long, thin *tail*, with the tuft of hairs at the end, how it switches it from side to side, and why; the large, mild *eye*, the soft covering of *hair*, its sleek, smooth look, the different colours, red, spotted, white, etc., the pretty look when clean. Though so large and strong, she is *gentle*. Even a little child may go near her without being hurt. She is *tame*. Other tame animals? their uses, etc.

Notice specially—

The **mouth,** very wide, with the large upper *lip*, which moves easily; as it stretches open we may see within, the great *tongue*, soft and fleshy, moving easily from side to side; the row of sharp *teeth* in lower jaw; none in the upper, which is like a sort of hard, horny pad.

The **horns,** spreading wide, or curving to the head, *tapering*, *hard*, *pointed*.

The **feet,** *hard*, *horny*, called **hoofs,** each one divided, as though cut in two parts—called *cloven*. Name other cloven-footed animals. Compare with foot of horse, and of cat; point out the differences.

III. **How the Cow lives.**—Where is the living cow seen? In towns, cows are kept, many together, in large sheds and yards; in the country, in fields and farmyards. For a large part of the year it is out in the fields. It can stand or walk over soft, wet ground where a horse's hoof would sink. Why is this? The cloven hoof spreads out and keeps it from sinking.

Feeding.—They *feed* on the *grass*. How strangely it eats! With its long neck and head bent down to the ground, it laps its lips and long tongue round a bunch of grass, pulls it into its mouth, cuts it off with its sharp front teeth, and swallows it at once! Compare with our mode of eating. We bite off a piece of bread, or of an apple, then chew, then swallow. The cow swallows without chewing! But is its food never chewed? Watch the cow after feeding in this way a long time. She quietly lies down on the grass, if it be a hot summer day, under a shady tree; she bites no more grass, yet she is chewing something. We may even see that something seems to be passing up through the throat into the mouth. So it is. After the grass is first swallowed, it *comes up again* into the mouth, in little, round, soft balls, and is chewed as we chew our food, and swallowed a second time. This is called *chewing the cud*. Other kinds of animals do this—*sheep*, *goats*, *deer*, *camel*, etc. In winter their food is *turnips*, *hay*, *straw*, etc.

IV. **Uses.**—1. **While living.**—**The milking.**—Twice every day, morning and afternoon, the cow is milked. Describe how early in the morning they are driven gently, often by a lad or young girl, from the field to the farmyard; they come quietly in, sometimes even at the well-known call; stand still while being milked; the rich, warm, white *milk* streams into the pail, and is carried off to the *dairy*.

Milk.—Speak of the wholesome, pleasant food which milk forms for little children and grown-up people; the many ways in which used, etc.

Cream.—Much of it is kept standing in large, wide basins—the heavy part sinks slowly, leaving on the top the thick, rich *cream*. This may be seen in the basin or jug of milk at home. For what is cream used? Difference between it and milk?

Butter.—From cream is made *butter*. It is put into a kind of barrel and turned round many times, or stirred in other ways; the thin, watery part separates from the thick, solid butter. When, and how, used?

Cheese.—Milk, too, is made into *cheese*. Something is put into it which changes it in a different way from cream. Who have seen and tasted *curds and whey?* The curd is pressed and salted, and thus made into *cheese*.

How many things come from milk? How does the cream come? What is butter made from? and how? How is cheese made?

Then sometimes the cow is used, like a cart-horse, for *drawing loads*.

2. **When dead.**—The cow is killed to give us food. Its *flesh* is *beef*. The man who kills it and sells the beef is a? *butcher*. Beef is one of the nicest and best kinds of food.

The **skin** is stripped of the hair, and made into *leather* by the *tanner*.

The **horns**, and even some of the **bones**, are used for knife-handles and many useful things.

The **hair** is used for stuffing cushions and seats, and in many other ways.

The **hoofs** make *glue;* so every part serves us in some way; living or dead, the cow is one of the most useful animals upon the earth.

(*Revise after each head and throughout.*)

BLACKBOARD SKETCH.

(*To be written as the lesson proceeds.*)

THE COW is—tame, gentle, very useful.
FOOD—Grass, turnips, hay.
CHEWS the cud. FOOT—Cloven.
ALIVE—Milk, butter, cheese.
DEAD—Beef, leather, horn, glue.

THE DOG.

I. **Introduction.**—Show pictures of dogs; ask for name; bring before the class the chief and better known characteristics. Where seen; what doing; various kinds; general description, etc. It is a *domestic* animal. Meaning of this. Other domestic animals. Why these are kept by us. For *food*, or *work*, or *pleasure*. Refer, generally, to the many sorts of dogs, their differences in size, form, covering, etc. The voice of the dog —*barking*, *howling*, *whining;* the short, sharp bark of the smaller dogs; the deep, loud sounding bark of the larger kinds. Then take more specially, the structure, or

II. **The Parts of the Dog.**—As in most animals, the principal parts are *four:* (1) The *head;* (2) the *body;* (3) the *legs;* (4) the *tail.*

1. The **head,** large behind, smaller towards the *nose*, tapering or *pointed.* The *eye*, *large*, *bright*, *quick*, and *far seeing.* The *ear* of some, large and overlapping, *i.e.* falling downwards; of others, shorter, pointed, upright; in all very quick to hear even faint sounds. The *nose* right at the end of the head, where it is best placed for smelling quickly. Its *scent*, *sight*, and *hearing* are very keen. The *mouth*, large, lying in a line with the head; it can open widely. Inside are the *teeth*, sharp, pointed, just fitted for *holding* and tearing. Its jaws are very strong.

2. The **body,** long, lithe, covered with hair; the hair is *long*, *thick*, and *shaggy* in the *collie*, or shepherd's dog, and the great *St. Bernard; curly* on the *retriever*, *spaniel*, etc.; *short*, *straight*, and *thin* in the fierce *bulldog*, and some *terriers; long*, *thin*, *smooth* in different kinds of *hounds.*

3. The **legs,** strong, firm in all; long and slender in the greyhound; shorter and thicker in many others. The *foot*, its four toes, each with a hard, horny claw; not so *sharp* as the cat's, and it cannot *be drawn in.* Its foot is called a *paw.* The dog *walks on its toes.* Under each is a thick, hard *knob* or *pad.* Use of this in its walking and running?

4. The **tail:** in some short, in others long. The covering, like that of the body, differs; shaggy, curly, thin, almost bare, etc.

(*Revise here.*)

III. **Nature and Uses.**—The keen sight, smell, hearing, its strength and quickness, fit it for chasing other animals; many are kept specially for this. The *deer* or *staghound*, the *foxhound*, the *greyhound*, the *terrier*, the *spaniel*, and others. Describe how the quick scent, or the keen sight or hearing, enable it to find its prey; how its strength and speed enable it to catch it. But how does it catch it? Its claws are not sharp as those of the cat, so it seizes with its *mouth.* Illustrate by reference to the way in which a ball or other object is caught—that, 'the cat catches with its claws,' 'the dog catches with its teeth.' The dog is fond of its master, and can be easily trained or taught to do many things. It is *quick to learn* and very *faithful.* Its quick hearing, its bark at the sound or sight of a stranger, make it useful as a *watch-dog.* Describe its use for guarding houses, farms, or other places. Many are kept for the *pleasure* given by their fond, faithful ways; others for their great use, as sheep-dogs, watch-dogs, etc. Illustrate by story or description their cleverness in such ways.

(*Revision.*)

THE SHEEP.

I. **Introduction.**—Show a picture of the sheep. By questions, requiring short and easy answers, bring out from the class what knowledge they have of it. What kind of animal it is. The size; how covered; where seen. What it feeds on. Sheep live many together. What this is called? Other animals which live in flocks. Birds do so. Another name for companies of animals. Let the class repeat in simple sentences the chief facts thus obtained. Thus:—*A sheep is covered with wool. Sheep feed on grass. Sheep live in flocks. A flock of sheep is a number living together*, etc.

II. **General Description.** — 1. Refer constantly to the picture as the description proceeds. Describe the rather *pointed head*, *short neck*, the *roundish body* and *back*, the *short tail*, the *four short legs*, the *cloven hoof*. What is meant by *cloven?* Other animals with cloven hoofs? The use of these in walking over marshy ground and steep hill-sides. Another animal like it which climbs hills well? *The goat.* Show how the hoof helps this by catching easily on little projecting stones.

2. **Their feeding.** — Describe the going out of the flock over the fields and hill-sides. They *crop the grass* as they go. As we watch them we see that they do not stop to chew it. What other animals eat like this? Refer to the lesson on the cow. Presently the sheep lie down. As we look at them we see that they are chewing. What is this called? Name all the animals which *chew the cud.* What kind of teeth have they? Where are the cutting teeth? The grinding teeth? What teeth like these have we? Where are the cutting teeth? The grinders?

3. **The flock.**—As they spread out over the field they still keep near together. They are looked after by? *the shepherd.* What has he to help him? How clever the sheep-dog is. If one sheep strays from the rest the dog runs to it and barks and drives it back to the flock. Sometimes sheep feed on hills and large open spaces; then at night the flock is brought back to the *fold.* Why is this? Run towards a sheep; will it try to bite you? The sheep is *gentle.* What will it do if the dog *runs* towards it? Sometimes sheep are kept for a long time standing or lying in one place. In some lands wild beasts try to seize and kill them. The sheep cannot fight and save themselves. Who takes care of them then? Let all repeat—*The sheep is gentle*, *timid*, *patient.*

III. **The Uses of the Sheep.**—1. **When living.**—Speak of the *covering*. Show a handful of wool. It is a kind of soft, fine, curly, matted hair. Show what a warm coat it makes for the sheep. What time of the year is it most needed? When can the sheep do without it? In spring-time *the wool is cut off.* Will this hurt the sheep? Is a little boy hurt by the cutting of his hair? Describe the *shearing;* the pent-up flock near a pond; the frightened sheep plunging one after another into the water; why this is done; the scrubbing it gets; the *panting* sheep seized by the shepherd and thrown down on the ground; the big shears he has; his clipping the wool off; the clever way in which all the wool is cut off in one *fleece.*

(*Revise this.*)—What is *shearing* the sheep? When are sheep sheared? What are the shears? What does mother use which is like them? Why is the sheep washed? What is a *fleece? A fleece is all the wool which is cut from one sheep.* What is a bit of the fleece called? But what is done with the wool which is cut off? It is carefully packed and sent away to be made into *worsted* and *cloth*, and many things. Another lesson will tell us something of the way in which this is done.

2. **When dead.**—The flesh of the sheep is eaten by us as part of our food. The sheep is killed by? *the butcher.* Its flesh is called? *mutton.* We see it hanging in the shops. It is cut into pieces. Each piece is? *a joint.* Ask for the name of some. A *leg* of mutton. A *shoulder.* The *breast.* What must be done with it before it is eaten? The young of the sheep is a? *lamb.* The *wool* of the sheep gives us *clothes.* Its flesh gives us *food.*

(*Revision.*)

THE CAMEL.

PLAN — I. GENERAL DESCRIPTION — II. STRUCTURE — III. ITS HOME—IV. HABITS AND USES.

I. **Introduce** by showing a picture of a camel. Give its name. Describe simply and prettily its strange look; the great *body* on the four long *legs;* the long *neck* lifting the great head high above the ground; the large, patient-looking *eyes;* the great *mouth;* on its back the big *hump*—some have two—seeming to be of no use and much in the way; the long ungainly-looking *legs;* the large *knees*, and great, flat *foot.* Have any seen a camel? Sometimes one may be seen walking on the roads; how strange and awkward its walk and look! Compare with the smart, handsome-looking horse. How much prettier it is; how much quicker it can run. Yet the camel, like the horse, is a *beast of burden.* What does that mean? Name other beasts of burden. The camel does not look so pretty as the horse, but it lives and works where a horse could not; it is well fitted for its own land, and the life it has to live. To know how this is, let us learn about—

II. **The Parts of the Camel's Body**—

The legs, long, strong; there are hard, rough places, like cushions, on the knees.

The feet, flat, broad; a thick, softish pad below, with two horny toes

The head, on the top of the long, high neck, tapering from back to front; the *eyes*, with long, hairy *eyelashes* hanging over them like a curtain; the *nostrils*, growing near the extreme point; eyes, ears, and nostrils covered and fringed with *long, thick hair;* the *mouth* large, like the cow's upper lip, which moves easily—inside hard, almost horny; *teeth* strong, sharp, jagged. The head is at the end of a long neck. Show how this enables it to see a long way off, and yet reach its food from the ground.

Its covering, long, thin, brown *hairs;* soft and silky when young; coarser when old.

On the back is the **hump;** made of tough, spongy kind of fat.

These parts can be seen, but there is a part stranger than any, inside the camel. Refer to the lesson on the cow, its stomach for the unchewed grass. So the camel has—

A stomach *for holding water;* it has in it a number of small holes. The camel can drink much more water than it needs at the time, filling the holes, from which it can take it again as it wants it.

How different this strange-looking animal from the trim, strong, nice look of the horse. But to know how good and useful it is, we must know something of—

III. **The Land it lives in.**—Describe the sandy *desert*, so different from our land; in large parts of it no fields or roads for travelling on; no grass, or trees, or streams, or ponds of water; the wide stretch of sand and gravel on all sides; the sun shines hot every day, sending a fierce heat on the rock and sand. These deserts must be crossed, and things of many sorts taken from place to place. No railway train, or waggon, or cart, or horse to draw it. No other animal than the camel could do this. Let us try to think—

IV. **How the Camel lives there.**—*Getting ready* for the journey.—The camel stands with many others, quiet and patient as the horse with us. Its master, strangely dressed in a long loose robe, with a sort of large handkerchief rolled round his head, is busy getting ready the load which the camel must carry. What is the load? Sometimes *ivory*, rolls of *silk*, *spices*, *honey*, *fruits* of many sorts, and many other things. How can this heavy load be lifted on its high back? The master makes it kneel down to be loaded. See, now, the use of the hard *cushions* on its knees. What is their use? Sometimes a man, or woman, or children are carried by it. When all is ready, they start on—

The journey.—They leave the houses, and pleasant gardens, and soon are in the *desert*. On every side, sand, stones, patches of rocks; every day the sun shines on it, no clouds or rain to cool it, till sand and rock and stones seem almost to scorch the hand or foot that touches it. But the camel can bear it. His foot does not sink in the sand. Why not? What keeps it from being scorched? As they go on, hot winds blow, filling the air with the fine bits—grains of sand. These strike the eyes of men and horses almost like sparks of fire, making them sore and painful. What has the camel to protect his eyes? and nostrils? Worse than all else is the *want of water*. Refer to thirst on hot summer days; none of us can tell how much worse it is there, as days pass, and the water they carry with them in *skins* is all used up. How is the camel helped to bear this? What was said about the camel's stomach? In this great need the water held in its stomach can be used, as the cow eats the grass which it swallowed without chewing.

When horses sink down and die, the camel travels patiently on, bearing its heavy load. Its *long legs* and *neck* keep the head high above the heated ground; it can see far off, too, and scent the water which lies in the distance.

The food it eats.—Sometimes *prickly shrubs.* Why do not the prickles hurt them? Then it has *beans*, leaves of the *date-palm*, *dates.* These have in them *stones*, like the plum and cherry, but harder; with its strong, sharp *teeth*, and hard, horny mouth, it can crush and eat these things easily. But sometimes the food they take with them is all eaten in the long journeys. Even then the camels can do better than many animals, for in a strange way the fat in its great ugly hump is used to keep it from starving. So this strong, patient, useful camel is one of the best of the many servants used by man.

(*Revision.*)—By questions on the main points, show specially how it is fitted for the land it lives in, by its *long legs*, flat, tough, springy *feet*, the long *eyelashes*, *stomach* for water, great *strength*, the *hump*, the hard *mouth*, and strong *teeth.*

While *living*, its *milk*, and a kind of butter and cheese made from it, give *food;* and when *dead*, its *flesh* is eaten, and its *hair* makes a kind of cloth, and other useful things.

This lesson can be divided into two, if necessary. Lesson I. to consist of parts I. and II.; Lesson II., parts III. and IV., preceded by recapitulation of Lesson I.

BLACKBOARD SKETCH.

CAMEL—Strong, patient, useful.

LEGS—Long, with hard cushions.

FEET—Flat, tough, springy.

HEAD—On high neck.

EYELASHES—Keep eyes safe.

MOUTH—Hard, horny: TEETH strong.

STOMACH—For water.

FITTED to live in hot, sandy DESERTS.

I.—THE ELEPHANT.

PLAN —GENERAL DESCRIPTION—STRUCTURE—HABITS AND FOOD—USES.

(Pictures of the elephant should be provided; also, if possible, an elephant's tooth, and specimens of ivory before and after manufacture.)

I. **Introduce** by showing picture of the elephant. By simple questions bring out what the children know of it, correcting, defining, and diffusing what the answers reveal. Describe its general appearance; its *great size;* the *big body*, standing much higher than the tallest horse, covered with thick, coarse *skin*, not hairy as the horse or cow, but rough and in folds; the *great head*, with its long, strange-looking *trunk*, hanging down or curled up in front; the *large ears;* the two long, smooth, curved *tusks;* the four big, round *legs*, like trunks of large trees. See its *quiet*, *patient look*, except when angry. Have any seen a real, living elephant? Where? What was it doing? Now and again we may see one or two; there are only few in this country. It is strange to look at; there is much about it which it will be nice to know.

II. **Parts.**—Let us learn first about its **head.** How large it is. See the shape, *round* at the top, *flattish* in front (compare with head of horse, or cow, etc.) On each side hangs a great **ear.** See their *shape*, how big they are. The **eyes** are *small*, almost hidden by the thick folds of skin around them. But the strangest part is the long **trunk.** Where does it grow from? Very thick where it begins, getting smaller to the end, like the well-shaped branch of a tree; but it is *not stiff* like it; the elephant can *move* it easily, and *bend* it in any way, like an india-rubber tube; it is a long, long nose, and has holes through it as the nose has.

Next the trunk are the **tusks.** How many? One on each side. What are they? They look like horns, but they grow from the mouth, and are really two great *teeth.* They are smooth, hard, whitish, and they taper like the trunk, but are stiff, and end in sharp points like the horns of a cow, but bigger and heavier. When the elephant lifts up its trunk, the great **mouth** can be seen below. How large it is; in it are the big, broad **teeth.** There are *four* of these, two above and two below; they are large and very heavy, the broad tops are not even but roughened, and in ridges. There is also a smooth, large, red **tongue** inside.

(*Revision*).—How many parts in the head have we talked about? What is its shape? What is the trunk? What can the elephant do with it? What are the tusks? How many other teeth has it? What shape are they? etc.

The head is joined to the body by—

The neck. It is short, thick, and very strong; how different from the neck of a horse or cow. Why? It must be because the head is so heavy. A long neck could hardly hold it up. Then comes—

The body. See how high it is. Some are so high that a man standing on the shoulders of another man, or on the back of a horse, could only reach the top of the back. (Compare with the height of the schoolroom. An average full-grown elephant is nine or ten feet high, sometimes reaching to fourteen feet. Show how near the ceiling, or how much above it, the back would come, how great a doorway it would need by which to enter, how much of the room it would take up, etc.)

It is the largest animal living on the land. One living creature only is larger; which is that? Where does the whale live?

To hold up this great heavy body, there are four legs; they are stout, almost straight, very strong. At the end are five toes, or hoofs, just as many as the toes of a child or man.

Now learn—

III. **How the Elephant lives.**—To know this, men must go to its home in a far-off land. Where is that? Elephants live in India and in Africa. You will some day learn where these places are.

Many strange and wonderful things may be learnt about these lands. There the sun shines every day, making a hot summer all the year round. In the shade of the deep forests, where the tall grass and climbing plants and shrubs of many sorts grow thick among the trees, many wild beasts and strange creatures find a home. Among them the elephants live, greatest of all and many together. What animals in this country live in the same way? What is a number of cattle called when feeding together? So elephants live? *in herds.* Those who have seen them, speak of the strange sight when the herd of great elephants comes crashing its way through trees and shrubs, trampling down the grass, snapping off the branches of trees, sometimes even breaking down tall trees. How can they do this? Now is the time to see how they use the parts we have talked about. They push their big *tusks* under trees and root them up, or push against them with the broad *forehead* or strong *shoulders.* With their long *trunk* they lay hold of the branches high up in the air, and tear them down. How strong the trunk is; it is used like the strong arm and hand of a man. They can lift with it the big trunk of a fallen tree out of their path. The end of the trunk is as small as a finger—and as useful, too. It can pick up a small nut or twig, or even a little seed, as easily as we can pick up a pin! The thick *skin* keeps them from being hurt as they push past the trees and through the prickly shrubs.

The elephant can *hear* a slight sound very quickly. A man once lay on the branch of a tree which grew close to a large pool of water. As he was hid there amongst the leaves, in the quiet night, a great herd of elephants, old and young, came from the forest near and plunged into the water. What had they come there for? He watched them below him for a time as they were drinking and cooling themselves, and then he broke off a small twig from the tree. It made but a little sound as he snapped it off, but the elephants heard it, and all rushed off in haste to the forest! What else does this story teach about the elephant? They are *quickly frightened.* What short word can we use for this? We call them *timid.* But when made angry they are often very *fierce.*

(*Revise here.*)

This helps us to know—

What kind of Animal the Elephant is.—Though so big and strong, they are not at all times dangerous. Name some animals that are so—lion, tiger, wolf, etc. Elephants do not catch other animals to feed on them. What, then, do they eat? They eat the same kind of food as horses and cows do. What do they eat? Where does their food come from? What name is given to all things that grow out of the ground? *The elephant eats vegetable food*—grass, herbs, leaves, young twigs, branches, sometimes the fruits of trees. How can it reach these? With its long trunk it tears them off, and puts them in big mouthfuls into its mouth. They are *crushed* and *chewed* by the *strong broad teeth.* Sometimes they get into fields of rice, planted by those who live near the woods, and gather up great sheaves of it in their trunks, and trample down the rest. But is the elephant always timid and frightened? No; sometimes it puts forth its great strength in a fierce and terrible way. If a tiger or lion or other wild beast comes against it, it beats it down with hard blows of its trunk; the tusks pierce it, or pin it to the ground; the great feet trample it down. So, too, it sometimes turns in fury upon the hunter who tries to catch it or to shoot it.

(*Revise.*)—What does the elephant eat? How does it gather its food? How does it fight when angry? etc.

IV. **Why men catch the Elephant.**– Of what use is it? When dead, *ivory* is got from the great tusks. This is of great value, and used in many ways. How smooth and pleasant it is to handle. What pretty things can be made from it—buttons, toys, and things useful for men's work. But the elephant is more useful to men while it is alive. It can be made *tame* as the horse and the dog are. It is *gentle* and *patient, and will do what its master bids it.* Because of this, and because it is so strong, it is a good and noble servant. It carries loads heavier than could be drawn by many horses, and over roads where they could not go. It can be taught to do many things in strange and clever ways. It knows, and gets fond of those who care for it, and are kind to it, and *remembers* them well. Many wonderful stories are told of its strange and curious ways. It is often dressed up grandly, and kings and nobles and great men ride in state upon its back.

(*Revise.*)—Why do men catch the elephant? What is got from the tusk? For what is ivory used? What work does the elephant do? Why is it so useful? In what countries does it live?

Brief Outline Notes of a similar Lesson, adapted for the Youngest Class of an Infants' School.

II.—THE ELEPHANT.

Description.—Here is a picture of a great animal. See its big body, how large and high it is, larger than a horse or cow. (Compare with these and with the height of a man.) Look at its large legs, like trunks of trees; the round foot, and the five toes. How heavy its step must be!

Parts.—See, now, the **trunk**: it grows out of the head, it is a long, long nose, can be moved about in any way. The elephant uses it as we use our hand and arm! It lifts heavy things with it—the trunk of a tree, a man. It can tear down branches of trees—it is *very strong*. But it can also *pick up little things*—an apple, or nut, or small leaf, as we can pick up a pin!

Here are the **tusks**: they grow out of the mouth, and are *two great teeth*, they get smaller towards the end, like a cow's horn; how *smooth* they are, and *very heavy*, a child could not lift one.

Habits.—In their own land, *many* elephants *live together*. as cows do here in the fields. They eat the same kind of food, too. What food does the cow eat? The elephant eats *grass, leaves, and small branches of trees, rice, etc.*, things which *grow out of the ground*.

We see only few elephants in this country. They live in a hot country, far away. They like to get under the shade of the great trees, and into the water to cool themselves, as cows do here in summer days. How strange to see them going in a great company through the dark woods, and across the plains, crashing down trees, trampling the rice and grass!

Use.—Men sometimes catch them and make them work; at first they are very angry, and stamp, and toss their trunks about, making a great noise. They soon get quiet, and are *tamed*, and work for their masters, as horses do. But they are stronger, and can carry far heavier loads. They are *patient* and *gentle*, and grow very fond of those who feed them and care for them.

The few we see are brought from their far-off land that people here may know what kind of creature the elephant is.

(These Notes indicate the matter, arrangement, general style of language, and to a limited extent the method of giving it. This should have in it a large admixture of questions, simple elliptical forms of sentences, and frequent revision.)

THE LION.

I. **General Description.**—Show a good picture of the lion. Bring out, by question and description, a clear general idea of the various *parts*, *shape*, *appearance*, *covering*, *colour*, and what may be suggested by its whole look as to the sort of animal it is.

1 **General:** the large, firm-set *head;* the fierce, bright, bold-looking *eye;* the great *mouth*—it can stretch open very wide; the long, strong-looking *body;* the firm *legs;* the long, tufted *tail;* the covering of brown, yellowish *hair*, especially the great *mane.* What other animal has a mane? In what is it like the lion's? In what does it differ? The *size* of the lion; when full-grown, almost as large as a cart-horse, but stouter and stronger looking.

2. **Special:** (*a*) The **head:** its roundish shape, firmly set upon the shoulders; the short, thick, strong neck. The *eye*—large, glittering; where placed; it seems to spread widely open in the darkness. The *mouth:* its great size; on each side are long hairs, which stretch out on each side. They are called *whiskers*, or *feelers.* The *teeth:* large, sharp, very strong. Show specimen; sketch on blackboard the shape—those in front, sharp, pointed, tapering, curved; those behind, jagged, sharp, cutting teeth. The *ears:* high on the head, wide apart. The *nose:* placed well out in front, with wide nostrils.

(*b*) The **feet:** Shape, five toes on front, four on hind feet; under each, a strong, sharp, curved *claw* (draw shape on board); it can be put out or drawn in, and covered with a kind of sheath. Illustrate the use of this by sheath of scissors.

II. **Comparison with Cat.**—(This is the most natural, as it is the simplest and clearest, mode of giving children a good idea of structure and habits of the lion.) A few well-directed questions will bring out from the children the chief points of likeness. What animal do we know with roundish head, sharp teeth, claws which can be drawn in and out? Refer in succession, by question chiefly, to shape, structure, position of head, eye, nose, teeth, legs, claws; thus bring out and state *that the lion is a sort of large cat.* Trace the comparison throughout. Ask all to repeat in what they are alike, in what they differ. What has the lion which the cat has not? Show a picture of the *lioness.* It is much more like the cat. State that other animals are also like it. Ask for or give names, as *tiger*, *panther*, *leopard*, etc. This will lead up to—

III. **What kind of Animal the Lion is, and how it lives.**—What is the use to the cat of her quick eye? sharp claws, etc.? *To enable her to catch mice.* Like the cat, the lion catches other animals. It is a *beast of prey.* What does this mean? Other beasts of prey? Is the lion ever seen in this country? Where and how? It lives in far-off lands. It is a *wild animal.* Describe the dense forests and wide plains in which it lives; its coming out at night; its quiet, stealthy step; why so quiet? and how? its keen scent; the bright glaring eye; the quick hearing; its finding and drawing near its prey—the deer, the great buffalo, etc.; sometimes getting near where men live, to catch the sheep, cow, horse, and even a man; the great roar it gives like no other animal's cry; the long, quick spring; the fierce, sharp grip; the use of claw and teeth. How active, and strong, and fierce it is. It has been known to carry a horse or cow away.

(*Revise and recapitulate the chief points.*)

For Blackboard Sketch see p. 14.

Group 3. — Lessons on Birds.

I.—BIRDS (GENERAL).

(*These lessons should be illustrated by pictures of various birds, and, so far as practicable, by specimens of stuffed birds, claws, beak, eggs, and nests, to be shown as they are referred to.*)

I. **Introduction.**—A lesson about *Birds!* Where is the little boy or girl who does not like to see them, and hear them? Why is this? Because of their pretty shapes and colours: their quick moving from place to place; *hopping*, *walking*, *swimming*, *climbing*, specially their *flying:* their sweet and pleasant *singing*, etc. Birds are in all parts of the earth: in the cold icy lands of the north; on the tops of the high hills; in the islands of the sea, and in all lands where men have been. Birds are of many different *sizes:* some taller than the tallest man; some smaller than the tiny hand of a little child. What is the name of the largest bird you know? The smallest? Refer to birds seen about us. *Tame* birds in the house? *canary*, *parrot*, etc.: in the farmyard? *poultry*, *ducks*, *pigeons*, etc.

Wild birds in the woods and hedges. Name some. Some birds are seen everywhere, as the *sparrow;* how active, and pert, and bold it is! how noisy its chirping! What birds come in spring? and summer? Why do they come and go year by year? Children in the country see and hear many more than those in town. Why is this? Name all the birds you know. By the sea-side others are seen. What are they? Interest the class by references to well-known birds—the *lark* singing high in the air; the *nightingale*, in summer nights; the *rooks* cawing in the tall trees; the sweet song of *thrush* and *blackbird;* the winter song of the *robin*, etc.

The home of the bird is a *nest.* How got? where placed? Some on *trees*, some on *ground*, some on *cliffs.* What is done with it, etc.

II. **General Description.**—Though so different in size, birds are much alike in several things.

1. **Their shape.** — Describe the *roundish body;* small *head;* often a long *neck;* the *bill*, its shape, use, etc.: when very strong and sharp called a *beak.* Name birds with *bills;* with *beaks:* the *tail*, made of? *feathers;* some broad, spreading like a fan, as *pigeon*, *peacock*, etc.; some long, stretching far away behind, as *pheasant;* some curved, or in a bunch, as the *cock*, etc.: how pretty the colour and form!

2. **Two legs and two wings.**—Uses of these; the different ways in which birds can go about. Refer to the **wings**; spreading in the *eagle*, and *swan;* long and slender in the *swallow*, and some *sea-birds;* thick and warm in the *hen*, etc.

3. **The legs and feet.** — Strong, sharp claws of eagle, etc.; long and naked in *stork* and *wading birds; short* and *thin-skinned* in *fowls* and other *scraping* birds; the moveable, firm-holding, toes of *parrot*, and other climbers; the *flat, webbed* foot of *duck*, and other swimmers.

4. **The covering.**—*Feathers*—Show and describe their forms and parts; the firm *quill;* the smooth, soft *beard;* the tiny *barbs* or hooks by which they cling together; they grow out of the skin, as the hairs from our head. How *smooth*, and *light*, and *warm*, the covering they make! how pleasant to feel! how pretty the colours are!

5. **Birds fly.**—How wonderful this is! They are so made that they can take much more air into their bodies than other animals of the same size. This warm air helps to make them *lighter*. (Illustrate by reference to child's toy balloon, soap bubble, etc.) The *wings* spread out upon the air help them too. Watch the *swallow*, or *crow*, or *pigeon*, how easily and smoothly it goes through the air! Many birds about us fly only short distances at a time: but others fly for many, many days, resting only on the water of the sea—how long the swallow's journey is from land to land!

6. **Birds lay eggs.**—All birds come from eggs laid by the mother bird. Outside is the? *shell*, it is *smooth* and *hard*, but *breaks easily*. What do we say of it? Inside is the *yolk* and the *white*—and a tiny part from which the young bird grows. Eggs are all of the same shape, but they differ in *size*, and in *colour;* some are very prettily marked.

(*Revise.*)

BLACKBOARD SKETCH.

BIRDS: Live in all lands: Build nests: Lay eggs.

BIRDS { *HAVE* { *Body: bill or beak: tail.*
Wings, legs, feathers.
CAN *fly, swim, walk, hop, climb.*

II.—BIRDS (GENERAL).

I. **Revision** of previous lesson, especially bringing well out the various points in which birds are alike, as *feathers*, *wings*, *bill* or *beak*, *foot*, etc.

There are many ways in which birds are not alike—they differ in the *way in which they are made*; the *kind of food they eat*; the *kind of place in which they live.* Let us learn some of the—

II. **Kinds of Birds.**

1. **Birds of Prey.**—What does this mean? *Prey* means *something caught by a living animal.* These are birds which catch and kill other living creatures. What kind of bird must it be to do this? To *see* its prey it must have a *sharp*, *quick eye.* To catch it, it must be able to fly very quickly, and so needs *strong*, *large wings*, and sharp, strong *claws* and *beak.* The *eagle is such a bird of prey*: so is the *hawk*, and also the *owl.* Describe the things caught by each as food—other *birds*, *rabbits*, *deer*, *lambs*, *mice*, etc. Many birds of prey catch *fish.*

2. **Swimming Birds.**—Ask for names of such.—*Duck*, *swan*, *goose*, *sea-gulls.* The kind of foot they have—why *flat? webbed?* etc. How these help the swimming? What they look for, and feed on, in the water? Notice the *flat bill* of duck and swan: their searching in the mud for *worms*, etc., catching *small fish*, eating *water weeds*, etc.: the sharp, strong bill of the sea birds, how quickly they catch the fish, how firmly they hold it, etc.

3. **Wading Birds.**—What is wading? Refer to children's wading in the sands at sea-side—clothes tucked-up, feet and legs bare. Why? So wading birds have *bare*, and generally, *long* legs—why no feathers on them? what the long legs do? Why they wade? Not for *play*, but *searching for food.* What they look for? the long *neck*, and often the very long *bill*, such birds have. Why so made?—name some—and show picture of—as *stork*, *heron*, *flamingo.*

4. **Scraping Birds.**—Why so called? Refer to the *common hen*, watch it *scraping.* Why they scrape? and where?

The kind of *foot*, how it differs from *duck* and *hawk.* Why this is. The food they find by scraping: *worms*, *grubs*, *seeds*, etc.

5. **Perching Birds.**—Refer to *canary* in its cage, the *sparrow*, or other common birds, how they *perch* on twigs or branches of trees. Most of the common smaller birds about us are of this kind. Many of them are singing birds. They may be seen in woods and hedges. Ask for names of all that are known. *Sparrow*, *robin*, *canary*, *lark*, *finch*, *blackbird*, *thrush*, etc. Some are *climbers*—*parrot*, *woodpecker*, etc.

We must now think of the—

III. **Uses of Birds.**—Let us put first—

1. **The pleasure they give.**—What is pleasant about birds? Their pretty *forms* and *colours:* their quick and easy *movements*, on the *earth*, in the *air*, among the *trees*, on the *water.* The names of these movements? Their sweet *singing.* Refer to the pleasant *twitter* of the *swallows*, and *cawing* of the *rooks* on summer days; the pretty trilling of the *canary* and *robin*, and *linnet* and *finch;* the loud, sweet song of the *blackbird* and *thrush*, and of the *lark*, too, so high up as to be but a speck in the sky, yet filling all the air with sound. How dull the country would be without birds! how full of joy they make it!

2. **For food.**—Many are eaten: name them. *Fowls*, *ducks*, *geese*, *turkeys.* What others? Their eggs, too, are eaten. How they are used. In some lands the eggs of birds form much of the food of the people.

3. **The feathers.**—How used; ornaments on dress, officers' hats, etc. The fine waving plumes of the *ostrich*, *pheasant*, etc. The softer *down* of other birds for beds, pillows: *quills* for pens, etc.

4. **Eating insects,** which would destroy fruits, corn, and other plants. In some lands much harm is done by these, and birds have been brought from other parts to destroy them.

Revision by help of the

BLACKBOARD SKETCH.

(*The forms of bills, beaks, claws, etc., should also be sketched.*)

I. BIRDS { *Alike in feathers, wings, feet, bill.*
Differ in colour, size, food, homes.

II. KINDS {
1. Birds of Prey: Eagle, Hawk, Owl.
2. Swimmers: Duck, Swan, Sea-gull.
3. Waders: Heron, Stork, Flamingo.
4. Scrapers: Hen, Turkey, Pheasant.
5. Perchers: Sparrow, Canary, Thrush.

III. USES {
1. Pleasure. *3. Feathers.*
2. Food. *4. Eat insects.*

THE EAGLE.

I. **Its General Appearance.**—Show a picture of the eagle. By question and statement set forth a clear and vivid *general description* of the bird. Its *great size*, the largest measuring three feet in length, and nine feet from tip to tip of the outstretched wings. Show these measurements clearly on table or large blackboard, or the floor. Illustrate by comparison with size of the swan. The eagle is less bulky in body, but with larger stretch of wing and tail. It is one of the very largest flying birds. Its *beak*, curved, very strong and sharp, with a wide-stretching mouth; its *talons* or *claws*, four, three in front, one behind, sharp, very strong and curved. Its *eyes*, bright, bold-looking, and large; its large wide-spreading *wings* and *tail*, the beautiful covering of *feathers*, large on wing and tail, smaller on body, all of them rich in colour; different eagles having different colours—brown, reddish, grey, white, black, golden-coloured, making a soft, warm, light clothing for it.

II. Where, and how, the Eagle lives.

1. **The Eagle's home.**—Children who live in towns or where many people live together do not see eagles, unless it is one which has been caught and shut up in a cage. They live far away, where few people go; generally, where there are high hills, and great forests, or tall sea-cliffs. It usually makes its home on the top of a mountain. What is the home of a bird called? Describe the eagle's *nest.* Perched on the top of a high rock, reached, even by strong men, only by a long, weary climb over rocks and hills, not often looked into by the eye of any man. *What made of.* Small branches of trees and bushes put loosely together. There the mother bird lays two or three large eggs, from these come the young, called *eaglets.* On a ledge of rock near may be seen the bones of *other birds*, or of *hare*, *rabbit*, or even a *lamb* or young *deer.* How came these there? They are the bones of creatures caught by the parent birds, and brought to the young as food. *The eagle is a bird of prey.* What is a bird of prey? No other nest is near. No bird or animal lives near it. Even a man is in danger who goes near it. The eagle flies fiercely upon its foe, and strips and tears with its sharp talons and beak.

2. **How the Eagle gets its food.**—Describe vividly the starting upwards from the mountain top, rising high in the air, the circling flight, till almost out of sight, looking like a speck, though so large. But why does it fly so high? Can it find food there? No; but it can see over a wider space of ground, and so be better able to see where its prey is. (Explain and illustrate how this is.) But that it may see at such a distance, what kind of eyes must it have? Speak of its *keen, piercing sight.* Then how can it reach what it sees? Hares and rabbits run quickly out of sight; birds fly quickly away. Speak of the eagle's swift flight, the sudden drop, as of a stone out of the air. How does it seize its prey? The sharp talons, the strong, firm grip, the upward, darting flight should all be

described. What does it do with all it catches? Speak of its return to its home on the mountain top, its tearing its prey with the strong, sharp, curved beak, its feeding the young if it have any, and its feeding itself.

Let questions of revision bring out the several points of structure which have been taught, and how they affect the eagle's habits; the swift, strong wings; where they take the bird; why it goes there; the keen, piercing sight; the strong, sharp claws; the great strength; the sharp, curved beak, etc.

III. **Kinds of Eagles.**—Eagles are of different sizes and kinds. The largest and finest is the *Golden Eagle*, so called because of the rich golden colour of many of its feathers. Another is the *Sea Eagle* (Osprey). It lives on hills and cliffs near the sea, and catches fish. It sees the fish swimming near the top of the water and drops down upon it from its great height in the air.

The lesson should finish with a short, well-told story, illustrative of some of the points referred to.

For Blackboard Sketch see p. 15.

THE COMMON HEN.

(*In addition to suitable pictures, it will be very desirable to have specimens of feathers, and a wing, a foot, and a head, of the bird.*)

I. **Introduction.**—Show picture of the hen, or better, of a group of fowls. Describe, and elicit, what it suggests. Where are they? What are they doing? Here is the mother bird—*the hen*. Why does she scratch the ground? Running towards her are the little ones—*the chickens*. By them, or on the top of the heap of rubbish, is the male bird—*the cock;* speak of his strutting walk; how upright he stands; the flowing feathers of the tail, their pretty colour; how brave and handsome his look is, etc.

II. **Structure.**—Take in succession:—

The **head:** where placed. At the end of the short neck; the two *eyes* are bright and quick; the mouth is formed by the *bill;* it is made of two hard, sharp, pointed parts, etc.; it has two *ears;* they are hidden by the close covering of short feathers. At the top of the head is a small bunch of red, wrinkled skin, called a *comb;* larger and brighter coloured on the cock.

The **body,** round and plump, growing smaller towards the neck. Its *covering;* how many the feathers are; lying thick one upon another, in close, even rows; they grow out of the skin, as the hairs of our head do. Show how they lie, layer on layer, all pointing towards the tail. How smooth, and warm, and pleasant they feel—how pretty the colours and markings. Show specimens of feathers, and refer briefly to structure.

The **wings** (show specimen, or point them out on picture), where placed; how they spread; how they lie when closed; the long, large, end feathers; the smaller towards the shoulder.

The **tail:** the hen has a bunch of short, stiff feathers; the tail of the cock is handsome, flowing, bright-coloured, etc.

The **foot** (show specimen or picture), covered with tough, wrinkled skin; count the toes, three in front, spreading wide; one stretched behind—at the end of each a sharp, curved, strong claw; the use of these? What does the picture show about it?

(*Revise by collective and individual questions.*)

III. **Habits and Food.**—We must now learn *how these birds live.*

1. **Getting food.**—Very early in the morning the voice of the cock is heard. What is it called? Who can imitate its crow? It is often the first sound heard in the farmyard, as soon as the first sign of daylight is seen. Describe the waking up of other birds; the busy hen running out into the yard; her scratching the earth; what she is seeking; how she does it, etc. Look again at the *foot*—its tough, hard *skin;* the strong, horny, curved *claws,* etc. Show how well fitted for what it has to do. Other sorts of birds have feet like this, and scrape for their food as the hen does—*pigeons, pheasants, turkeys,* etc. They are called 'scraping' birds. Describe the noise the hen makes; it is called 'clucking.' She clucks louder, the chickens run round her; the noise they make—'chirping:' the hen has found *food* for them—*seeds, grubs, worms, crumbs of bread;* how fast they peck it up. Some one

comes into the yard—cock, hen, chickens, and other birds, all run round her. She throws out handfuls of *barley*, *bread-crumbs*, *leavings from dinner*, etc.: how they feed; the pretty sight and sound it is, etc.

2. **In danger.**—Watch them again: the tiny chickens are spread round far and wide, busily pecking, scraping, chirping, etc. Suddenly the mother hen makes a loud noise, more like a sort of shriek than clucking; the chickens all run towards her, their heads bent forward; they rush round her, she spreads out her wings, the feathers all *ruffled;* the little ones nestle close under them, all covered and out of sight; the other hens, and the cock too, clatter and make a great stir. What is it all about? What is the matter in the yard? As we look round we see one tiny chicken, too far off, or too late in running. *Pussy* has crept round the corner, or jumped over the wall, sly and swift; she has caught the little chicken in her sharp, strong claws, and run off with it. What will she do with it? So this tells us the *danger* in which they are, and how their watchful mother saves them. Sometimes instead of the cat, it is a *bird*, with sharp, strong claws and beak. Describe its hovering over the yard, dropping straight and swift as a stone, catching the chicken, and flying off with it, etc. It is called a 'hawk.'

3. **The eggs.**—A hen comes out of the henhouse, making a great noise—not 'clucking,' but *cackling.* Why does she do this? To tell every one *she has laid an egg.* Go and look at it—how warm it is; how white, and smooth, and hard the shell. What is done with the egg? Some are sold for eating; others are put in a nest, many together. The hen sits on them for many days, leaving them only for a few minutes at a time. She keeps them warm by the heat of her body and the soft, warm covering of her feathers. This is called *hatching.* Why does she do this? After a time the shell cracks, then comes from each egg a *tiny chicken.* Its body is naked, it is weak and timid, and keeps close to its mother, nestling in the warm shelter of her wings. Soon it begins to run about and scratch and peck; the feathers grow, small and very soft at first; it gets larger and stronger, until it becomes a full-grown bird.

(*Revise.*)

IV. Uses.—The last part of our lesson must be about, *What we do with them.* While living they give *eggs.* Speak of the many ways in which these are used—boiled, fried, in puddings, cakes, etc. etc.; the pleasant, wholesome food they make. When dead, the *flesh* is used as *food.* Good for all, but specially suited for sick and aged people. The *feathers,* for *ornament;* how employed—in *dress,* for *officers' hats,* for pretty things in the house, etc.; for various kinds of *work*—*oiling, gilding* things, etc.; the softer parts and the smaller feathers for *beds, pillows,* and *cushions.*

In this country they are *tame,* kept only in houses; there are lands where such fowls are wild, living in forests and trees as the wild birds of our land do.

Recapitulation.—Let us now put together what we have learnt in our lesson.

The mother bird is the? **hen**; the male is the? **cock**; the little ones are? **chickens.** The round, plump **body** is covered with **feathers**; these lie in thick, even rows, pointing towards the tail; they are smooth, warm, prettily coloured.

The **neck** is short, the **head** small, the **eyes** quick and bright, the **ears** hid by feathers, the **bill** short, horny, sharp. The **tail** of the cock is fine, and very pretty. The two **wings** lie close to the body, or can be spread out wide; with them the hen flies short distances, but quickly, or covers its young. The **foot** has three toes in front, one behind; tough skin and sharp claws. It scrapes for its food. What other birds are like it? The cock *crows,* beginning early in the morning; the hen *clucks,* or *cackles;* the chickens *chirp.*

The **food** is barley, bread, seeds, worms, grubs, etc.

The chickens are often in danger from the cat, hawks, etc.; they run for shelter and safety to their mother.

The hen lays *eggs.* She sits on them, keeping them warm. This is *hatching.* From the egg the little chicken comes. It is naked and timid, feathers soon grow on it, the chicken gets large, and is in time a hen or cock.

The hen is *useful:* its *eggs* and its *flesh* are good for food; its *feathers* for ornament, beds, etc.

In this land the hen is *tame;* there are *wild* fowls in some other lands.

The recapitulation may immediately follow the lesson, and should be largely interrogatory and elliptical. Unusual and principal words and phrases should be printed on the blackboard, as they occur. Or the recapitulation may be taken as part of a distinct lesson of revision of several previously given lessons.

Short sentences comprising simple statements of facts may be printed on the blackboard and repeated by the class, as :—

The Hen is the mother bird.
The little ones are Chickens.
The food is seeds, crumbs, worms.
They scratch the ground for food.

This lesson may be divided into two; the first ending with Section III., the second, taking Section IV., preceded by a revision of the first.

THE ROBIN.

(*A picture of the robin will be required, and a stuffed specimen will add interest to the lesson.*)

I. **Introduction.**—Begin by reference to the winter; the kind of weather we have, and the difference between it and the summer. Most of the flowers, the leaves of the trees, the tall grass, have all gone. Why is this? But what other changes are there? Where are the bees? the butterflies? the ants? Like the flowers, they are gone also. But this is not all. What else has gone? What do we miss in walking in the lanes and fields and woods? *The singing of the birds.* Many of these go from this country to warmer lands as the summer passes away. Are all birds gone? Some still remain with us. Name some that go. *Swallow*, *cuckoo*, *nightingale.* Name some which do not go away. *Sparrow*, *thrush*, *blackbird*, and especially *the robin.*

The robin is *a singing bird.* Name other singing birds. *Canary*, *thrush*, *lark*, *nightingale*, *blackbird*, etc. Which of these leave us in the winter?

II. **Description of the Robin.**—1. **General appearance.**—By help of the picture, describe its size, general shape, covering, etc. Like all birds, the robin is covered with feathers; it has two wings, two feet, and for a mouth it has a *bill.* What is the shape of the bill? It is hard, sharp at the edges, pointed. Some birds have much longer bills. Ask the names of these. The feathers are brown on the back, and on the upper part of the wings. Compare in size, colour, and shape with sparrow. But what is the colour of the breast-feathers of the robin? We now know how it gets its name. What is it called? *Robin Redbreast.* Its head is small, and turns quickly from side to side. So it can quickly find its food, and spy out any danger that is near. Describe the longish feathers of the *tail*, its *thin*, *slender*, *legs*, the *four claws* to each foot.

2. **Where and how it lives.**—Where is the robin seen? In *gardens*, *hedges*, *woods.* It is not noticed much in summer; many other birds are about. In winter, when birds are fewer, the pretty ways and sweet song, and bright red breast of the robin, make him much noticed and liked. But what is the food of the robin? *Seeds*, *insects*, *caterpillars*, *grubs*, *small worms.* We see him hopping over the ground, peeping sharply about. With his strong, sharp bill he pulls them out of the earth, and quickly eats them. In winter he often comes near our houses, and is glad of crumbs of bread. He seems less frightened to be near us than most wild birds are.

III. **The Robin's Nest.**—Describe this, and, if possible, show specimen. It builds its nest in hedges or low shrubs. Sometimes in trees, and often in very strange places. A robin once built its nest by the great Bible on the reading-desk in a church. Another among the books on a library shelf. Another in a school. Many children were there, but they did not disturb it. In its nest it lays three or four eggs, prettily speckled. What come from the eggs?

(*Revise each point.*)

THE OWL.

I. General Description. —Show a picture, or, better, a stuffed specimen. Direct attention to general shape, covering of feathers, wings, tail, two legs, claws, beak, etc. These show it to be *a bird.* Many such as this, live in this country, yet very few, perhaps none, of the children, have ever seen a living one. How is this? Where does it hide? What is its name? It comes out only *at night*, and hides away and sleeps during the day. It is called *the owl.* Look again at the claws. They are sharp, and curved, and strong. See the beak: it, too, is hooked and sharp. What other bird has beak and claws like it? Refer to the lesson on 'The Eagle.' What kind of bird is the eagle? *A bird of prey.* What does this mean? *A bird which catches other living creatures for its food. The owl is a bird of prey.* Let the children note the quaint, solemn look of its great eyes, and round head, and queer-looking beak.

II. **Where and how it lives.**—The owl makes its home in quiet, out-of-the-way places, and so is seldom seen by day. It likes a farmer's barn. What is a barn? Its roosting-place is among the rafters and beams close up under the roof, or in holes of old and ruined houses, especially when covered with ivy; or in the branches of thick-growing trees. Describe how, as evening comes on, the great, solemn-looking eyes open wide. Like the cats, they can see with very little light; they peer sharply out through the gloom, especially looking down on the ground. What is it looking for? A little rustling sound is heard among the dry twigs and grass and leaves; but the owl hears it, for *its hearing is quick.* In a moment down it drops, like a ball of soft wool, so quiet that it cannot be heard. It comes up again. What has it caught? *A tiny mouse.* Its sharp claws hold it fast, as the claws of the cat would; its hooked beak tears it in pieces, or sometimes it swallows it whole. It sets off on its swift, quiet flight over the fields, searching the hedgerows or the farmyard, dropping again and again, and catches many *mice*, sometimes *rats*, or even *small birds.* The owl, then, is *very useful.* Speak of the injury done by the field-mice and barn-mice to the growing crops, or to the corn in the barn, and especially the trouble caused by rats. Farmers are glad to know that the watchful owl is busy night after night. To feed their young they catch many *mice*, *rats*, *birds*; and some owls, which live near the sea, catch *fish*; they sit on a rock by the sea-shore, or fly over the water, and pounce quickly on the fish as they swim near the surface.

III. **Different kinds of Owls.**—*The eared owl*, with two tufts of feathers sticking up, like horns or ears, one on each side its head. Many of these live in England during the winter, and go away as spring comes on.

The white owl and *barn owl* are common round the farms in the country. People walking in dark lanes are often frightened by them as they fly quietly past in the darkness. The great *snowy owl*, covered with white feathers, lives in northern lands. It is large and strong, and catches and carries off rabbits, hares, and birds. In the high mountains of some lands are *eagle owls*, large and fierce. In other lands, *burrowing owls* live like rabbits, in holes of the earth, coming out for their flying hunts as night comes on.

Short sentences by way of summary should be repeated by the children, and for elder classes be written on the blackboard, thus:—

Owls are birds of prey.
They fly about at night.
Owls are quick to see, to hear, to catch.
They feed on mice, rats, birds, etc.
Some Owls are large and fierce.
There are White Owls, Eared Owls, Snowy Owls, Eagle Owls.

THE SEA-GULL.

I. **About Birds.**—Begin by a pleasant talk about *birds* in general. Names of birds known to the class? Where seen? The largest bird known to them? The smallest? Tame birds?

Wild birds? The different *kinds* of birds? How they differ? In shape? In size? In foot? wings? bill? In places, and ways of living? Where they build their nests? Names of some which build in trees? in hedges? on the ground? in holes? in cliffs and banks? etc. The name of a bird which *scrapes* the ground to find its food? The kind of food and claw the hen has? A bird which swims much? The kind of foot the duck and swan have? A bird which seizes and kills living animals for its food? The kind of foot and claw which the eagle and hawk have? What kind of beak have they? Show that the parts and forms of birds are fitted for the kind or way of life in which they live. Most kinds of birds live on the land, and find their food there, but many kinds live on or near the sea, and find their food in the great waters. One of these is—

II. **The Sea-Gull.**—Show a picture, and bring out clearly (1) its **form** and **parts,** etc. Its round, plump *body;* swelling *breast;* two long *wings* stretching backwards, when at rest, beyond the body; short *tail;* thick, short, round *neck* and *head;* bright, keen *eyes;* its long, strong, sharp, slightly curved *bill;* its short *legs* and *webbed feet.* Why webbed? Then its thick, close-growing, warm, covering of *feathers*, white, or grey, or black.

(2) **Where and how it lives.**—Describe the rocky cliffs on many parts of our sea-shore; some of these are almost covered with various sorts of sea-birds, perched on the rocks, flying many together in the air, plunging down into the sea, riding easily and gracefully on the tops of the waves. Among these are the *sea-gulls.* Speak of their vast numbers, their loud, strange cry or scream; the lively, animated look they give to the sea-shore. But what is their food? *Almost entirely, fish.* This is why they plunge into the water. How do they know where the fishes are? They watch with their bright, keen eye, till they see the fish swimming in the clear water below, then they fall like a stone into the water, and snap the fish with their sharp bill, and rise quickly out and fly off to a rocky ledge, and there eat it. The edges of the sharp bill are jagged, something like the teeth of a saw, and so hold the struggling fish tight and keep it from slipping out. Describe how, when many

fishes come together (a *shoal*) near the top of the water, great numbers of the sea-gulls plunge in together among them, screaming, and swimming about with great noise, and catch many of the fish.

(3) **The Sea-Gull's nest.**—Like other birds, the gulls build nests. Why do they need them? Where are they built? On the *ledges*, and *crevices*, and *bare tops of the rocks* close to the sea. Many nests are crowded together. In each are laid two or three spotted eggs. Many are taken by persons who hunt for them, and are used as food, as the eggs of the common hen are. The mother bird sits on the eggs, keeping them warm for many days. When *hatched*, the young bird within breaks the shell and comes out. It is very small and almost bare; soon it is covered with fine, soft, woolly-like feathers, called *down*. It moves about looking like a living ball of cotton wool. What food does it eat? The old birds bring it plenty. They tear in pieces the fish which they catch, and feed their young with it. In a few weeks the *down* on the young birds grows to feathers, and it gets large and strong, and flies off, like its parents, to swim in the sea and catch food for itself.

Group 4.—Lessons on Fishes, etc.

FISHES.

I. Show pictures of several kinds of fish. Ask for their names, and what is known about them. Ask for the names of other fish; where seen; when living; when dead; what is done with them; how men get them; the kinds of fish used as food at home. Any other particulars likely to awaken the interest of the class.

Speak then of—

II. **Where Fishes live.**—Always in the water. They die when taken out of it. They move by swimming. Land animals die when put under the water. They move by *walking*, *creeping*, *flying*. Why do they die when placed in the water? Because they *cannot breathe*. They breathe in the air only. But fishes also breathe. How do they get the air? *From the* *water* in which they live. They do not need much. There is some air in the water. Fishes breathe through their gills. They swim by their *fins* and their *tail.*

III. **The parts of a Fish.** — 1. **The gills.** — Where placed. Show or describe, the thin, reddish, fringe-like gill; how it is opened and closed; the passing of the water through it. The air is got from the water in passing through the gills. If the gills were kept shut, the fish must die, as surely as a bird or child whose mouth and nose were kept shut. Show the covering of the gill which closes it as the lips do the mouth.

2. **The fins and tail.** — *The fins.* — Where placed; on back, belly, sides. Describe *shape, folding*, etc.; how they can be spread out or laid flat against the body; their motion when swimming, etc. *The tail* — common shape, as in *mackerel, herring*, etc., *spreading* out *fan-like*, or *long* and *pointed* towards the end, as in *pike*, and in most of the great fierce *sharks.* It is by the motion of the *tail*, more even than by the *fins*, that the fish can swim.

3. **The head.**—In most fish it tapers to a *point*, or nearly so. Near the end, or in some quite under the head, is the *mouth.* Show and describe its horseshoe shape; how wide it opens; the rows of sharp teeth within; in many these are *curved backwards.* Nearly all fish feed on other fishes, which they catch. Show how the form and position of the teeth fit them for this purpose.

4. **The scales.**—These cover the body of *many sorts* of small fish; they are like thin, delicate shells. Show how they overlap each other from the head towards the tail; their pretty, shining look; rounded or curved forms, etc. What is their use? They cover the body; they are smooth, and have an oily or shiny covering; and so the fish slips easily through the water.

IV. **Different kinds of Fish.** — There are very many different sorts. Describe a few of the best known common fish. The *mackerel, herring*, and *salmon*, long, oval shape, tapering from point of head to shoulders, and covered with scales. The *cod*, larger, less slender, without scales. The *sole, plaice*, or other *flat* fish. These live near the bottom of the sea, sometimes buried in the mud or sand. Other flat fish of different sorts, as *ray*, *skate*, etc.; their squarer shape, and long, slender tail, etc. The *eel*, long, slender, slimy, swims with a *wavy* motion, and buries itself in the mud. The *shark*, large, fierce, strong; how dangerous it is, and why, etc.

V. **The Uses and the Number of Fish.**—Fish are chiefly *used for food*. All the year round some kinds or other may be had. Name the common sorts. The great shiploads, hundreds in number, brought in day by day; the wholesome food they give us; the many hundreds of persons, on all parts of our coasts, and in all towns, who get their living by *catching*, or *preparing*, or *bringing*, and *selling* fish.

(*Revise.*)

BLACKBOARD SKETCH.

FISHES	*Live in water: breathe through gills; used for food; great in number.*
PARTS	Gills *for breathing.* Fins *and* Tail *for swimming.* Head, *pointed:* Mouth, *large:* Teeth, *many, sharp.* Scales *for covering: smooth, oily.*
KINDS	Scaly—*Herring, Salmon, Mackerel.* Slimy—*Cod, Eel.* Flat—*Sole, Plaice, Skate.* Dangerous—*Shark.*

THE MACKEREL.

(*For illustration, have a good picture, or, better still, if convenient,* a real mackerel.)

I. **General Description.**—The mackerel is *a fish.* First speak of what it *is*, or *is like*, in common with other fishes. Where do fishes live?

Swimming.—How do they move about? *Fishes live in water. They swim.* To do this they need? *fins* and a *tail.*

Breathing.—How do they breathe in water? Like animals on land, *fishes breathe air.* But where and how do they get on? As they live *in* the water, the air they breathe must be got by them from the water. Explain that the water has in it much air. This may be seen sometimes as tiny bubbles rising to the top of the water. If air be kept out of the water, fishes die, as we do when air is kept from us. Refer to the glass globes, or other vessels in which fish are kept. These are sometimes left covered up, by accident or carelessness. What happens then? *The poor little fishes die.* Why is this? What does this show about them? Now how do fishes breathe? Not through the mouth as we do, but through the *gills.* As the water passes through them, they take out the air which is in it. The three things spoken of about fishes?

1. Fishes *live in water, swim* about; *breathe air* from the water.
2. For swimming they use their *fins and tail.*
3. For breathing they use their *gills.*

II. **Particular Description.** — **General shape.** — Head pointed; growing thicker to the shoulder. *Body tapering* to the tail. *Mouth*, wide; *teeth*, many, sharp, pointed, curving backwards; reason of this, in catching other fish for food; *eyes*, large, round, bright, one on each side of the head; *gills*, where placed, show the thin, flaky, stiffish *covers;* the red gills within; *fins*, one large, three-cornered, on *upper* part of back; another, like it, but smaller, on lower part of back; between it and tail five smaller, all standing upright, two at side, and two below near the shoulder; their shape. Near the tail are others below like those above the back. Count all the fins. Note how they can be folded up and down, a little like a fan. Their use? *The tail*, shape? *in two parts*, *each pointed.* Describe the use in *guiding*, and in helping to swim. The *covering* scales, show and describe; the pretty markings of blue and green, with broad, black, stripes above, white below.

III. **How Mackerel are caught.**—Name the various ways in which fish may be caught. Mackerel are caught by hooks and nets, especially by the latter. Which will catch the greatest number? Describe the long, long net; the rope, with many pieces of lead on one edge and corks on the other. Why so placed? Effect in keeping the net, when stretched out, like a wall. The great *shoals* (explain meaning) of mackerel swim against it; their heads go through the meshes, the shoulders cannot pass; as they try to draw back, the gill-covers open, and *the fish is caught.* Then the great net is drawn up into the boat, with the fish in it.

Speak of the *vast numbers* brought in day by day to the market during this time of the year; the *wholesome food* it furnishes; the great numbers of people who live by the work of *fishing*, *carrying*, and *selling* the mackerel, etc.

(*Revision.*)

THE HERRING.

I. **Introductory.**—Awaken the interest of the class by brisk questioning on what they know of fishes. The names of common or well-known fish. How we know a fish. Where it lives. Its covering. Some with *scales*—*salmon*, *mackerel*, etc. Some with smooth shiny skins—*cod*, *eel*, etc. Some with shell—*oyster*, *crab*, *shrimp*, etc. How fishes move: the crab by *walking* as well as *swimming.* Most fishes by *swimming* only. What parts of the fish are used for swimming? *Fins and tail.* For what fishes are used. The pleasant, wholesome *food* they make. How they are caught—*nets*, *hooks* and *line*, etc.

II. **Description.**—Show a picture of the herring, also, if practicable, *a real herring.* By questions and description bring clearly out its *general appearance*, *form*, *size*, *covering*, *chief parts.*

1. The tapering **body**, both towards the head and the tail; thickest and broadest at the *shoulder* of the fish. How this enables it to pass through the waters quite easily.

2. **The head**, pointed or tapering; the wide, deep *mouth*, with the rows of pointed *teeth* inside; the under jaw pushed out beyond the upper. The large round *eyes;* where placed; behind them are the *gills;* nature and use of these, covered with thin, stiffish, leather-like plates; inside are the red, fringe-like gills. Explain how these strain the water as it passes through them, and so the fish gets from it the *air for breathing.*

3. **The fins**, two near the head, low down on the body; one larger, triangular in shape, on the back; two smaller below it, from the belly; one also below and near the tail, seven in all. The use of these, how they easily fold, or wave from side to side, being a kind of web stretched over their flexible bones.

4. **The tail**, its two-parted *shape*, its easy waving and folding, made something like the fin, its use in *guiding*, and for swimming.

5. **The covering**; *scales*, their *shape*, *number*, *colour*, pretty, even arrangement, lying over each other as the feathers of a bird.

III. **How the Herring is caught.**—Describe their mode of life. Vast numbers together, moving in great bodies through the water, as large flocks of birds do through the air. What is such a large number of fish called? Just after midsummer, in July and August, they come from the far-off deep sea in great numbers, near certain parts of the shore, to lay their eggs in shallow water. The fishermen watch for their coming. Describe the fleet of great boats, or *smacks;* the *shooting*, or casting out of the great net, reaching a long, long distance through the water; the hauling of them up; the fish, in hundreds, often in thousands, caught in the *meshes*, and thrown into the boats. The vast numbers thus caught, make them *cheap*. Speak of the nice, wholesome food they make; sometimes eaten *fresh*, just as they come from the sea; sometimes *salted*, and packed away in brine in casks for winter use; sometimes smoked, sold as *red herrings;* difference between this and fresh herring?

The herring is not only caught by man, but by *birds*. Describe the great flocks of sea-birds, *gulls*, *cormorants*, etc., which follow the *shoals* of herrings, darting down into the water and bringing the herring up in their beaks. Caught also by many kinds of fish: the great shark, some kinds of whales and others swim through and through the thickly packed shoals, catching and eating them in great numbers.

In November the shoals of herrings leave the water near the land and go away again into the deep seas, out of the fishermen's reach, coming back again in the following summer.

Let each separate division of the lesson be well revised before proceeding to the next.

THE COD.

(*A picture of the cod should be provided, and, if practicable, a specimen of the cod itself.*)

I. **General Description.**—The cod is a? *fish*. Like other fishes, it lives in? *the water*. Some fishes live in ponds and rivers and lakes. What kind of water is found in these? Many fish live only in the sea. What kind of water is there? The cod lives in the sea. Ask for the names of other sea-fish; of freshwater fish. Look well at the cod, and note its *shape*. It has *head*, *body*, *fins*, *tail*. The head is large; the part behind it is called the *shoulders*. This part is very thick. The body gets smaller towards the tail.

The fins.—On the back are three; it has fins below also; the tail is a kind of fin. Point out its shape, different from that of the trout, salmon, etc. What is the use of the fins and tail? In *the head* is the large mouth. Note how wide when opened. Inside are the rows of sharp, slender *teeth*, and the great tongue. The tongue is thick and fleshy. Note the gills, the use of these? The large round *eyes*, one in each side of the head. From the bottom of the lower jaw hangs *the beard*. Speak of *its colour*, a greyish-white above, the belly white. Many fish are covered with scales: *herring*, *trout*, *salmon*, *mackerel*. The cod has scales, but they are very thin, and fall off the body. *The skin* feels soft and slimy. *The flesh* is white.

II. **Where the Cod lives.**—Describe their vast numbers, living together, more than can be counted. A large number of fish swimming in this way together is called *a shoal*. A large number of sheep is? *a flock*; of cattle? *a herd*. What is a *shoal* of fishes? These shoals of cod-fish come at certain times of the year in the seas near England and Scotland, but in far greater numbers than in any other part near the great island of Newfoundland, far away in the great sea. The cod is very useful for food. But how are they got? Describe the fishery. Thousands of men go out every year from this and other lands to catch them. How are fishes caught? By nets and by hook and line. The cod is caught by the hook. It is large and strong, and would break the net in pieces. Many thousands are caught day by day in the season. As the men catch them, the tongue is cut out of the big ones. This is salted and used as food. From the liver is got *cod liver oil*. This is used as a medicine. The flesh, too, of many is salted. Many are brought fresh and sold for food.

Finish by speaking of the wonderful numbers caught; the cheap, wholesome food it gives to many; the thousands of men employed in fishing, in building the ships, in buying and selling.

(*Revise each point carefully.*)

THE WHALE.

I. **General Description.**—It is well to begin by showing a picture of the whale. A graphic description of its great size, strange shape, and the place and manner in which it passes its life, will awaken an interest in the children, and secure their close attention. Questioning freely, and describing what the children do not know, first make plain its great *size;* very much larger than the largest living thing they have seen. Illustrate the size of the larger species (sixty or seventy feet, or more) by comparison with the size of the schoolroom, or the space it would occupy if laid in the playground. Describe its swift motion through the water, the great strength of its tail and fins, seen in the lashing of the sea into foam; how it swims through the great waters of the ocean, the largest living thing on the land or in the water.

II. **The Parts of the Whale.**—Point out and name in succession, *the head*, *the body*, *the tail*, *the fins.* Show how much of the whole creature its head is, nearly or quite one-third of the whole.

1. **The head.**—Its great *mouth;* how strange the shape is, how wide when stretched open; look inside it; it has no teeth, but from the upper jaw all round stretch down to the lower jaw many long, thin, bony things; they lie close together, yet water can pass between them—this is *whalebone;* show its toughness, strength, flexibility, etc. Within this is the great *tongue*, large, thick, and soft. The *eyes;* where placed; how small they are. Where are the *ears?* They can hardly be seen. These are too smallish dents, one on each side of the head.

How the Whale breathes.—Look again at the top of the head. Far forward at the upper part of the *snout* are two smallish holes. What are these? *They are the nostrils.* What is their use? *They are for breathing through.* Fishes do not breathe like this. What part of the fish is that by which it breathes? The whale breathes as land animals do, through the nose. Its blood is warm, too, but the blood of fishes is cold. Look now at the upper part of the head, near the back. Here are two other holes. Through these the whale blows out the air, as we blow through the mouth or nose. Describe the noise it makes, and how the steam, rising with the air, and the water blown away around it, makes it look like two spouts of steamy water.

2. **The body.**—Its great size; its dark, smooth, shining-looking skin; below it, is a thick layer of fat, called the blubber.

3. **The tail.**—Its great size; flat, two-cornered; it is horizontal; compare with salmon or other fish whose tail is upright.

4. **The fins.**—Shape; where and how placed. By these and the tail the *whale swims swiftly.*

III. **Catching and Uses.**—Describe the whale fishery; the sailing away to the northern seas; the harpooning and spearing; the cutting it up for its blubber, giving oil; the whalebone, and in some, another kind of fat, much prized, called spermaceti. Speak of the many men engaged in this work, and of the many uses to which the oil and whalebone are put.

(*Revision.*)

THE CRAB.

(*For illustration, provide a good picture of the crab, real specimens of the shell, and, if posssble, a living specimen.*)

Introduction.—Appearance and parts; bring these clearly out by questions and description—the body, the legs, the pincers, the head, with the horns or feelers, the eyes, mouth, etc.

I. **General Description**—1. **The body.**—Broad, flat, curved; the colour a reddish brown, some green, black, etc. It is hard and strong; it is a shell.

2. **The legs.**—Their number? Eight, four on each side; long, jointed, ending in sharpish points.

3. **The pincers.**—Their number? where placed? shape? the curious joint, etc. Both legs and pincers covered with hard shell.

4. **The horns or feelers.**—How many? Where these are? Long, slender, jointed.

5. **The eyes.**—Bright when living; black, one on each side, standing out from the head.

6. **The mouth.**—Where placed? Right under the head.

II. **Where and how it lives.**—Speak of where the crab may be seen. How many have been by the sea-side? In almost every part of our sea-shore crabs may be found. Describe where seen. On the sand and pebbles and rocks over which the tide ebbs and flows; in the little rock-pools filled with water; under the great bunches of seaweed; or in holes in the rocks and under stones. How funnily they scuttle away as one goes near them! They do not run forwards or backwards, but *sideways.* Sometimes they are out of the water; sometimes they are in the water. They are a kind of fish, and because of their covering they are called shell-fish. Name other shell-fish. Some are like the crab, as the lobster; many are unlike it. The oyster, mussel, whelk, shrimp, winkle, all these and many others are *shell-fish.* What do the crabs feed upon? They eat the flesh of other fishes. Some eat the flesh of creatures that have been drowned.

III. **How the Crab grows.**—Its shell is hard and stiff, and does not get larger. But the largest crab was once a little one. What, then, can it do as it grows? Speak of a little boy's jacket or boot; it cannot get larger. But the body and the foot grow. What, then, must be done? The small one is left off and a larger one got. Explain by help of this illustration how the crab, as it grows larger, casts off its old shell. Its body is then soft. Where is it to get a new shell? A little boy must have a jacket and a boot *made* for him; but the shell of the crab *grows out of its body*, and covers it up anew. Illustrate by growth of the finger-nails. While the new one is growing it hides away under a stone, or in a hole in a rock, and then comes out with its new, larger, hard shell. Sometimes one of its legs get broken off, or one of its hard claws. Soon a new one begins to grow, and after a time it gets to be something like the old one.

IV. **Different kinds of Crabs.**—1. **The Common Crab.** What is this used for? How large and heavy some of them are. They are found on the rocks and shores of our own and many other lands. They are caught in a large flat-bottomed kind of basket. It has a hole in the top through which the crab can creep, but it cannot get out again.

2. **The Green Crab.**—This is the little crab found on the shores. It is not good for eating.

3. **The Spider Crab.**—Why does it get its name? Because

of its small, round body, and long spider-like legs. It is a quick runner too.

4. **The Hermit Crab.**—Describe this little pretty creature: how it pushes its long, shell-less tail into the empty shell of some other fish, as the whelk or winkle; its hard, shelly legs and claw sticking out from the mouth of the shell. It lives alone in its shell, as the old hermits did in caves and cells, and so gets its name.

5. Some crabs live in *fresh* water; and

6. There are **Land Crabs.** In hot lands like India, the West Indian Islands, etc., many such are found. They live in the thick grass, and make holes for themselves in the sandy earth.

(*Revise.*)

Sentences comprising some chief facts should be written on the Blackboard, and repeated by the class. See p. 18.

Group 5.—Lesson about Insects, etc.

INSECTS.

I. **Introduction.**—Show specimens or pictures of various sorts of insects, as bee, butterfly, silkworm, beetle, etc. Bring out from the class such knowledge as they have of their names, habits, etc., *where seen*, and *when*, *or* Refer to seasons of the year. One of the differences between summer and winter is the presence or absence of insects. In warm weather the *butterfly*, and *bee*, flit across our path; the *house fly* is busy at home; the *gnats*, in the air; the *dragon fly*, over pools of water; *beetles*, of many sizes and forms, some prettily coloured, run over the earth; *ants*, too, and others in great numbers; and many curious little creatures swim merrily in the water. Bees, butterflies, moths, beetles, flies, and many other living things like them are called **insects.**

II. **Different kinds of Insects.**—1. **Butterflies.**—Show and describe the general appearance; the *four wings*, two generally larger and longer; two shorter and broader; the pretty *colours*, *markings*, and *shape*, *spread out* when flying; *upright* when still. The colours and marks are made by beautiful, tiny, *scales*, or *feathers*, which lap over each other like slates on a house roof; the *six legs*, long, slender, and jointed; the long, slender *body*, the *two horns* branching out from the head. Some butterflies in foreign lands are much larger than any here.

2. **Moths.**—These fly about in the evening and morning, the bodies are thicker. Some are large and strong in flight. The *silkworm* is a moth.

3. **Bees, Wasps, etc.**—The wasps are thin, not so prettily coloured as moths or butterflies. Where do we see the bees chiefly? What do they find in the flowers? Where do they take it? What is a hive? What else is found in the hive? The wasp is prettily marked, but what dangerous thing does it carry? It makes a curious *nest*, often in a *hollow tree*, or in a *hole* in the ground. The little busy *ant* when young has four wings like those of the bee.

4. **Flies.**—The many kinds of these; the small *house fly*, their great numbers, the trouble they give; the *bluebottle*, the *horse fly*. *Gnats* are a kind of fly. So are the beautiful *dragon flies;* speak of their long, thin body; the long, delicate, bright-coloured wings; their swift flight, etc.

5. **Beetles.**—Some are very disagreeable and ill-looking, but many are pretty in form and colours. All have hard, shining wings, which cover two thinner ones, folded below them. Speak of the pretty little spotted *ladybird*, the great horned *stagbeetle*, the curious *waterbeetle*, the common cock-chafer, etc. There are many other kinds—some living in the earth, others in the water, or on trees, or in the air.

(*Revision.*)

III. **The Parts of an Insect.—The body.**—This is in three parts. Show *head*, *chest* *hinder part*.

1. In the **head** are its *eyes*, its *two horns*, it can move them quickly, and *feels* with them; the *mouth;* with its tiny sharp *teeth* it chews its food, or it has a long tongue, which it thrusts down deep into flowers, to get the sweet syrup from them. The *butterfly* does this, and especially the *bee*. What is the sweet syrup called?

2. **The chest.**—From it grow the *wings* and the *legs*. Many have *four*. Name some. Others have *two*. *Flies* of many sorts, and *gnats*. But many have *no wings;* these *creep*, or leap about. The wings differ in kind; describe the thin, delicate wing of *dragon fly* or *bee;* the richly-coloured wing of *butterfly* and *moth*, the hard case-like wing of *beetle*, etc. Insects have *six legs*, they spread out, three on each side. Many run very swiftly, others *creep*. Some kinds which live in the earth have *many legs*.

3. **The hinder part.**—This is larger than the other parts; in many covered with small, hardish wings which overlap each other, or with short, close hairs. In it is the *sting* of the wasp and bee. In others a long, sting-like tube with which it lays its eggs. But more strange than the *parts* are—

IV. **The Changes of Insects.**—Beasts, birds, fishes *grow larger* as they live, but they do not change their form. Insects change *three times* during their life. (1) First, they are shut up in a tiny *egg*. (2) After a time, from the broken shell there creeps out a *grub*, or *maggot*, or *caterpillar*. It crawls about, and eats much, and grows quickly. Speak of where, and how, these are seen—the *green grub* on the cabbage and other plants; the *silkworm*, its food; others on decaying vegetables or flesh. (3) Again, after a time it creeps away, and hides in the *earth*, or under the *leaves* or *bark* of trees, and is shut up as though dead in a *hard case;* is called a *chrysalis*. It neither eats nor moves—for a time; then the case is broken, and (4) there struggles out the *butterfly*, or *bee*, or *beetle*, etc.

Refer briefly to the *uses of insects;* they eat and so *remove rotting leaves*, flesh, etc., which would be offensive and hurtful; they are like little *scavengers*. The *honey* of the bee, *silk* of the silkworm, *beautiful colours* from the crushed bodies of others are other uses. Urge all to look well at the many insects about them, and note their ways; and speak of the *wrong of cruelty* to any.

(*Revise.*)

BLACKBOARD SKETCH.

INSECTS.

KINDS—Butterflies, Moths, Flies, Ants, Beetles.

PARTS (3)
- *1. Head*
  - eyes—seeing.
  - horns—feeling.
  - mouth—feeding.
- *2. Chest*
  - legs, wings — moving.
- *3. Hindpart*—legs, sting.

CHANGES—Egg, Grub, Chrysalis, Insect.

USES
- To remove hurtful things.
- To give honey, silk, colours.

This lesson can be conveniently divided, Sections III. and IV. forming a second lesson.

THE BEE.

(*Materials to be provided: Picture of bees, and specimens in their several stages of development, eggs, caterpillar, chrysalis, bee, hive, etc., honey, wax, honeycomb.*)

Introduction.—Speak of the season. Through the bright summer days all have seen the 'busy bee;' have heard its humming sound; watched its quick flying from flower to flower, or straight up, and far off through the air. Where has it come from? Why does it light upon the flowers? What does it get from them? The bees fly back to their home. What is it called? Watch the bees coming in and out. How many they are! How busy—running, flying, ever at work. Show a little *honey*. How nice to eat! And the wax, too. Where does it get these? and how? Let us learn all we can about—

I. **The Bee** (*Show picture or chalk drawing*).—The three chief parts—

In front, the **head**; in the middle, the **chest**; behind, the **trunk.** Living creatures of this form are called **insects.** Name other insects.

1. In the **head** are the *eyes;* they stand out large and bright, one on each side: two *horns*, standing straight out, by these it feels its way in the dark hive, and among the leaves of the flowers. Butterflies and moths have the same sort of horns, so have beetles. The *mouth.* What are the upper and under parts of our mouth called? So the bee has two *jaws*, with small, sharp, saw-like *teeth.* Most wonderful of all, the *tongue.* When the bee flies, the long tongue is drawn into the mouth, or *rolled up;* at other times it darts in and out of the mouth quickly, and is stretched out very far.

2. **The chest** is *hard*, almost *horny* in parts; in other parts covered with thick, short *hairs.* From it grow *four wings*, thin, delicate, with many fine lines—*nerves*—over them. *Six legs.* Notice the *joints*, the stiff hairs, the two small *pockets* in the hinder thighs. They are fringed with fine hairs, and called *baskets.* The bee can fly long distances in a short time. It is *strong* and *quick* in flight.

3. **The trunk.**—*Abdomen*, or hinder part. It seems made of flat, smooth rings, which slip easily over each other. There are *six* of them, and so the trunk *bends* easily about. At the end is the *sting.* It is small but hard, and very sharp, like a fine, keen *needle.* But the hurt it makes is much worse than the prick of a needle. What other insects have stings? When does the bee use its sting? and why? We need care when near them. If one light upon us, the best way is to remain *quite still;* it will soon fly off again.

II. **How the Bee lives.**—Watch the bee as it flies past. How quickly it goes! Hear the humming sound it makes. Where does it go? Stand near the flowers in the garden, or the wild flowers in the field, or under the thick, spreading leaves of the great lime-trees. How busy the bees are! and how many of them there are! Watch one as it pushes its head right into the flower; if a large one, laying hold by its sharp, curved little claws; out comes the long, curved tongue; it thrusts it down to the far end, and searches there a moment. What does it seek there? In the flower is a tiny drop of something *sweet.* What is it called? Here, then, the bee finds the *honey.* It is quickly out again, and into another, then another, and another. In each flower it finds but a tiny morsel, often none—other bees have been before it. How, then, does it get so much? Because it visits *hundreds of flowers.* It is busy all the summer day; thousands of bees are doing this, and so the great stores of honey are got. Does it do any good to the flowers for the honey it gets from them? Yes, in a strange and wonderful way. Look carefully at it. On the hairs of its head and legs are tiny grains of dust, brown, and gold colour. Where does it come from? *Out of the flowers.* It carries it to other flowers, and this helps to form and ripen the seed from which other flowers spring. What does the bee do with the honey it gets? Describe the busy hive—the bees coming and going all day long, each one taking its little store of honey. Where does it put it? Show a piece of *honeycomb* or a drawing of it; the thin walls of *wax;* the little holes in which the honey is stored. Where does the honeycomb come from? *It is made by the bees.* From between the little rings of its trunk it comes out as the wax does in our ears. Why does the bee gather the honey? *Because it is its food.* It is mixed with the dust from the flowers and eaten. But why does it store it up? That it may have *food for the winter* days, when no flowers are out, and when it is too cold and dark to leave its hive.

The Bee is useful to us.—Its honey is pleasant and good for food, and for medicine when we are sick. (Let some taste the honey.) Its wax is of great use too, for *candles,* for *moulding* things, and in many other ways.

(*Revise.*)

III. **How the Bee changes.**—Many of the bees lay small eggs, little as pins' heads. The silkworm does so. Who has seen some? From each little egg, in time, comes out a tiny worm; it is called a *grub* or *caterpillar.* This grows large, eating much food; they are put by the bees into the little holes of the comb. There comes a time when they cannot eat; they stay still, and a thin, dry case grows over them. Each one is now a *chrysalis.* The caterpillar creeps, having two rows of short legs; the chrysalis has no eyes or legs; it lies quite still, and seems dead, but it is not so. Days pass; the dry case breaks asunder, and out comes the busy, active bee, with *wings*, *legs*, *horns*, and *sting!* What are the four changes through which these pass? First, the *egg;* second, the *caterpillar;* third, the *chrysalis;* fourth, the *butterfly.* All *flies* and *moths* and *butterflies* change in this way.

(*Revision.*)

BLACKBOARD SKETCH.

THE BUSY BEE.

HEAD—	*CHEST—*	*TRUNK—*
With Eyes, Horns,	*Wings (4)*	*Rings (6)*
Mouth, Tongue.	*Legs (6)*	*Sting.*

Gets Honey from Flowers.
Wax = Honeycomb.

Is (1) Egg. *(3) Chrysalis.*
(2) Caterpillar. *(4) Bee.*

THE BUTTERFLY.

(*Specimens of butterflies, of the chrysalis, and the eggs should be provided; also large diagrams to show, to the class, by the enlarged scale, the separate parts, their form, and structure.*)

I. **General Description.**—When do we see butterflies flying about? One of the many signs of summer are the *butterflies.*

They are not seen in winter. Why not? What becomes of them then? Where may we see them in the summer days? Why are they seldom seen in the streets of the town? How pretty they are, in shape, and colour, and motion. How quickly they fly from flower to flower. To do this they have? *wings.* How quickly they fly away as we go near them How do they know we are near them? To see us they have? *eyes.* When they settle upon a flower it is upon their? *legs.* They fly, and walk, and see. Do they need food? Yes, every living thing must have food of some sort. So all have a mouth of some sort, and some way of getting food. Ask for different ways in which animals, birds, fishes, etc., feed. The butterfly feeds on the sweet syrupy kind of *food which they find in flowers.* How do they get it out? Our lesson will tell us this as we learn more about it. Refer generally to the many different kinds of butterflies. They differ in *size*, *shape*, *colour.* All are pretty; many very beautiful.

II. **The Structure or Parts.**—By diagram and specimen, show that each butterfly has its *body in three parts*: the *front* part, the *middle* part, the *hinder* part, and other parts attached to these.

1. **The head.**—This is the front part; it is small, round, easily moves from side to side and backwards and forwards, as our head on the neck. On the head are the *eyes.* By the diagram and explanation, make as plain as may be the great *size*, the *many separate eyes* in each, so *it can see on all sides.* In front are the two *feelers*; they are long, and each has a little knob at the end. Below, in front, is the long tongue. Show how it curls round and round when not in use. It can be quickly unrolled and pushed down deep into the bottom of a flower in search of the sugary syrup there. We know now how the butterfly gets its food.

2. **The chest, or middle part of the body.**—It is rather longer than the head; from it grow the *wings* and the *legs.* The *wings*, two pairs; how many altogether; the two in front overlapping the two behind; their shape, use, etc. (Diagram and blackboard and specimen butterfly must be freely and carefully used to make all plain.) The *legs*, six, in three pairs; three on each side Show how and where they grow from the

chest. They are long, thin, jointed, and at the foot have little rough hairs, so that they easily catch hold and cling to the flower, leaf, or wall.

3. **The abdomen.**—This is the hinder part; its rings, hairy covering, long, roundish shape, etc., should next be described.

III. **How the Butterfly grows.**—Where do we see the butterfly? What is it doing among the flowers? It not only gets its food from flowers, but lays tiny eggs on the leaves. Let us now see what happens in the life of a butterfly.

1. **The egg** is small, black, and many lie in a cluster; the heat of the sun keeps them warm; after a time the little shell cracks, and there creeps out—

2. **The caterpillar, or grub.**—It feeds on the cabbage, or other leaves; grows larger. After a time it creeps away to a crack in a wall, or in the bark of a tree, or on a post; it fastens itself to the post by a tiny thread like a bit of spider's web; then it shrivels up, the skin dries and hardens. It is now—

3. **The chrysalis.**—Show specimen. It stays like this through the cold, dark days of winter. It neither moves nor eats, but it still lives. What is its next change? From the chrysalis, which opens its case, there comes out—

4. **The Butterfly.**—Name all the parts of it. It has *head*, *chest*, and *abdomen; eyes*, *feelers*, *tongue*, *wings*, and *legs*. In turn it lays other eggs, from which afterwards come caterpillar, chrysalis, butterfly.

This may serve for two lessons, save with advanced children; the second lesson consisting of recapitulation of the General Description and Structure, and the Changes in the life of the butterfly.

THE SILKWORM.

I. **Introduction.**—Show a few articles made of silk; ribbon, tassels, a piece of silk, silk thread, etc. Speak of its smoothness, prettiness, strength, etc. What is silk made from? The fine threads are *spun* by a living creature. Show the cocoon.

Speak of the sources of other material for clothing. *Leather* is the skin of an animal; *wool* grows on the sheep; *silk* is spun by the silkworm, a kind of caterpillar. What other living creature spins a thread? What does the spider make of it? Where is the web to be seen? The threads spun by the spider are spread out flat, making its *web.* The threads spun by the silkworm are wound closely together, making the *cocoon.* Let all notice its *form,* the fine, delicate threads of which made, etc. Question as to its colour, shape, etc. Unwind a little of it. Show how closely and evenly the thread is wound, like cotton upon a reel. This is *spun out of the mouth* of—

II. **The Silkworm.**—Explain, by reference to the lesson on 'Insects,' that it is not always a *worm* or *caterpillar.* It is so in one part of its life only. Show a good picture of a silkworm in its several states; also, if possible, actual specimens of these. Show, and refer to, *the moth.* It is an insect. All insects are (1) an *egg,* (2) a *worm,* or *grub,* or *caterpillar,* (3) a *chrysalis,* (4) a *moth* or *butterfly,* etc. Let us learn about—

1. **The egg.**—Show the tiny, black egg. Describe them, like little, black specks, laid many at a time by the moth. Through the cold days of winter they seem dead; but when the bright summer days come, the little shell breaks; out of it creeps a tiny, black—

2. **Worm.**—Each has a long body, two little rows of legs, one on each side, a small black head, bright eyes, a tiny mouth. It seems always hungry and always eating. What is its food? *The leaf of the mulberry tree.* Describe its quick growth, the *changing of the skin,* the large, white *caterpillar.* After a time it ceases to eat. It moves its head from side to side, and from front to back. Out of its mouth comes a fine yellow thread. This is the silk. And so it spins the cocoon *round itself,* shutting itself up in its dark little chamber as the kernel of a nut in its shell. Can it live there? Yes. But it does not eat or move for many days. It is shut up in a small wrinkled case; it is called—

3. **The chrysalis.**—Show one, or a picture of one. For a time it does not move, except when touched. Describe its

shape, size, appearance. So it stays for nine or ten days, then it bursts its skin and eats its way through the silk cocoon. Now it is changed again: it comes out—

4. **The moth.**—Describe the two soft, silky wings; the three parts of the body, the head, the chest, the hinder part, the six legs, the two feathery horns or feelers, the large, bright eyes. It can fly or crawl about. It lays a lot of tiny, black eggs, and then dies. Butterflies and all insects change like this.

(*Revision.*)

THE ANT.

(*Have pictures of the ant in its several states, or, if these be not accessible, pictures of other insects to illustrate the stages of insect life.*)

I. **General Description.**—Begin by referring to ants as they may be seen in bright summer weather, running about the paths and roadsides in the country, and among the grass. Their great number, their quick running; the busy look they have. What are they doing? Where are they going? How do they live? Describe their *size* and general appearance. Very much smaller than the smallest house fly. Reddish brown in *colour*. Each has a long, narrow body; a tiny head, with two longish horns, curving out, one on each side; a narrow chest, from which grow six legs; three on each side. They are jointed, with tiny claws at the end. The hinder part of the body is rounder, and ends in a sharp kind of short tail or point.

II. **How Ants live.**—1. **Their home.**—Where is their home? They make it in the ground. Often in sandy earth. Sometimes under the bark of trees, or in the trunks of trees which have died. The wood is then soft. The ants bore long, narrow tunnels through. In these homes of theirs they lay their eggs and feed their young, and bring in food for themselves, and for the ants which stay at home and work. Often they make their home under a flat, heavy stone on the pathway or field. Describe the funny scene when the stone is lifted away, or turned over, the frightened hurrying away of the hundreds of ants, many of them carrying off the eggs which contain the young ants, or the little whitish *grub* which is an ant not yet fully formed. Some build little sand-hills and hollow out their homes in them.

2. **Their food.**—Some ants feed on decaying bits of leaves, or on the dead bodies of birds, or mice, or other insects; some feed on grains of wheat or on other seeds. They are fond of a sweet, sugary kind of substance which they find on the leaves of different sorts of trees.

There are great ants in hot countries which build high piles of sand into ant-hills. These are fierce, and bite sharply at any one touching them. They have, too, a kind of poisonous sting, and so are very dangerous. The *white ants* get into houses, and bore their way through the legs of chairs and tables, and other furniture, and so spoil it soon.

III. **Changes in the Ant's life.**—The ant is an *insect.* What is that? Refer to previous lessons on insects. Ask shape, parts, how they change at different times of their lives. So show—

1. **The egg.**—The mother ant lays hundreds of these. They are very small; from each one, after awhile, creeps out—

2. **The grub.**—A small, white, creeping thing. The older ants keep them safely in their homes, and bring them food. Next, is a kind of—

3. **Chrysalis.**—It stays still, without eating, for a time; then out comes—

4. **The perfect Ant.**—It has *head* and *body*, and *legs;* on its head are *eyes* and *horns*, and a busy *mouth.* Some ants have four *wings;* many of them have no wings, but are the ants we see running about in the summer.

(*Revision.*)

FLIES.

I. **About Insects.**—1. **General Description.**—Our lesson is about a *kind of insect.* What are *insects?* Give the *names* of those you know. Where seen? and when? Why do we see so few in the winter? In what season are there many about us? Why do they come in summer? Bring out the *general description* of insects. In what they are all somewhat alike. They are *small* compared with birds and other animals. They seem *divided into parts;* the number of parts; *head*, *chest*, *abdomen*, or hinder part; how they *see*, *feel*, *move about*. Where the *eyes* and *feelers* are. Many kinds have *wings* as well as feet. Where placed? Number of wings, kind; *number of legs*. Where placed? Call for names of sorts illustrative of different kinds. By help of revision of former lessons, compare various sorts, illustrating each as named, by pictures, etc. In the same way, bring out—

2. **Changes in insect life.**—The *butterfly*, *bee*, *moth*, *ant*, etc., were not always as we see them. First, there was the tiny *egg;* from it came out the creeping *caterpillar* or *grub;* this changed into the *chrysalis*, which cannot move about. It stays in one place. Where does it hide? It seems *dead*. Is it really so? How do we know it lives? In time, the covering or case opens, and out comes the perfect insect, the bee, dragon fly, etc.

(*Revise here carefully.*)

II. **The Fly.**—We cannot see any during winter. What is the reason of this? When do the flies come out? Speak of their great numbers as seen in the *hot days of summer*. How they swarm in the house, in the garden, in many shops, even in the busy streets. What places in the house do they like best? In what shops do we see most? Why is this? What this teaches about their *food*, and their ways of life.

The parts of the Fly.—What are the chief parts? In the *head* are the eyes. They look like tiny, bright, black points on each side the head. There are many of them: they can easily see on all sides. Show that you cannot put the finger or a much smaller thing near them without their seeing it, and quickly flying off. How do they feed? Have flies a mouth? Describe the long, slender, tongue-like thing which is pushed out upon the sugar, or what else it feeds on. It sucks up its food this way. They can *hear*, too, for a noise frightens them away. They have *legs*. How many? Where placed? How cleverly they run up the smooth, upright pane of the window, or the looking-glass, or even crawl quickly over the ceiling.

Their *wings*, how many? Where placed? Describe the thin, delicate-veined wing; how *quickly* they fly; how long they often keep on the wing, going round and round, chasing each other in the air.

Flies are often *troublesome;* there are so many; they get on our food, and mark the glass and the furniture; they tease us with a tickling kind of feeling when they settle on face or hand. Are *flies* of any use? What would the *spider* or the *swallow* say to this if they could answer? *Flies are the food* of various other living creatures. *Birds*, and *reptiles*, and *fish* eat them. How do they catch them? The spider by its *web;* the frog, lizard, etc., by darting out its *tongue* upon them; the swallow by its open *mouth;* the fish by *snapping* at them as they are near the surface of the water.

III. **Kinds of Flies.**—*House fly*, *bluebottle*, *dragon fly;* where and how such lived. How they differ from each other. In what they are all alike. Shape; kind of wing; mode of life, etc.

(*Revise.*)

THE SPIDER.

(*A large picture of a spider, or blackboard diagram, will be required. A specimen or two of the spider in a glass bottle or otherwise will awaken interest, but it is too small to be of much real service for class illustration.*)

I. **General.**—First ask for what the children can tell of the spider. What it makes for itself? Where the web is seen? Why it is stretched out in corners of the room? How easily it is broken. How quickly the spider runs away, and how cleverly up the wall, and along the ceiling, and on its own web. Sometimes it falls, but not to the ground. What stops it? It runs quickly up the fine thread into its web again. Where else may spiders and their webs be seen? In the trees and on the bushes in the garden, or even on the blades of grass near the ground. The spider that lives there is of a different kind from that which lives in the house. There are spiders, too, which live upon the water. Who have seen them running quickly over the pond in the field or garden? At what time of the year? How quickly and prettily they glide. These, again, are different from the others. Name the different kinds of spiders. There are *house spiders*, *garden spiders*, and *water spiders*.

II. **The parts of a Spider.**—Show the diagram. There are three chief parts: *the head*, *the body*, *the legs*.

1. **The head.**—How small it is; in it are *the eyes*. They are very small, bright, and very quick to see. Why does it need to be so quick? What does it want to catch? It has *eight eyes;* four on each side of its head. It can see on all sides at once. What have we to do if we wish to see on all sides of us? The spider does not need to turn its head for this. When the spider has caught the fly, what does it want to do with it? What will it need for this? The spider then has a *mouth*. Point out its position. It is very small, but to the fly it is strong and terrible. It bites sharp, and quickly kills it.

2. **The body.**—Its shape, round like a small bird's egg, or cherry stone, or pea, etc. It is striped, or marked with different colours. From it are laid the *eggs*, from which the young spiders come. But something more than this. From it is spun the wonderful *web;* out of tiny holes come the fine, delicate *threads*.

3. **The legs.**—Count them. There are *eight*, four on each side. Direct attention to the many *joints*, the *fine hairs;* describe especially the sharp, curved *claws*, and under them the many tiny hooks, like the sharp points of little fish-hooks. What is the use of these? Show how by them it climbs up the wall and along the ceiling, holding on to the very small roughnesses to be found there.

III. **The Web and its use.**—By the help of the diagram, and what the children have seen, describe the structure and position of the web. The long, straight lines, fastened from side to side; they all meet in the middle like the straight parts of a wheel; then the cross threads round and round at even distances. How fine and delicate they are! They sway about with a breath, yet they are strong enough to bear the spider, and to catch in it the fly. When first made, if it be touched, it sticks to the finger. How is that? Every line has on it many tiny drops of a kind of gum. How pretty the webs look with the glittering drops in the morning sunshine.

IV. **How the Spider lives.**—Describe its patient sitting in the middle of its web. Why does it wait there? It is *watching for its prey.* Soon a fly dashes on the web; it feels itself caught, as a bird or a fish, in a net; it pulls, and flaps its wings, and struggles to get free. Why cannot it do so? Now we see the use of the tiny, sticky, gum drops. But out comes the spider from its hiding-place. It gives a sharp *bite* to the fly; it *stings* it, too, something like a wasp or a bee sting, though not in the same way. Some spiders spin a web round the fly, rolling it round and round, and tying up its wings and legs, so that it cannot move. It sucks out the soft juices from the body, and throws the rest from the web. The web gets often broken, and the spider is kept busy mending it, or making it anew.

(*Revise.*)

Group 6.—Lessons on Natural Phenomena.

THINGS FOUND IN THE EARTH.

(*The lesson should be illustrated throughout by specimens of the various things spoken of: stones, earths, metals, etc.*)

I. **Introduction.**—Refer to the earth upon which we live. In a brief, graphic way show that all living things have their home upon it; all plants grow out of it. Fields, gardens, hills, valleys, are parts of the *surface* of the earth. The mould of the garden, the sand of the sea-shore, the clay, the rocks of the hills and cliffs, all differ from one another. Our lesson is to tell us something about these, and about other *things found in the earth.*

II. **Rocks.**—Show specimens of common rocks. A *bit of granite*, *sandstone*, *limestone*, *flint*, *slate*, etc.

1. **Stones.**—What do we call small pieces like this? They are *stones. Stones are small pieces of rock.* Refer to what is seen when holes are dug in the ground. On the top is the *mould;* below it is *gravel*, or *sand*, or *clay;* below that again,

II. **What the Air does.**—1. **We breathe the Air.**—Think now what breathing is. We draw air into the body. We breathe air out of the body. Let the class do this, noting carefully the going in and out of the air by breathing. What the air does in the body other lessons must teach. If we should stop breathing, even for a few minutes, we should die. That is how *drowning* causes death. The *water stops breathing. We need air to keep us alive.* All living things need air; even fishes need it. If no air gets into the water, fishes die. Men, beasts, birds, fishes, insects—all need air. Even *plants need air.* If air cannot get to a plant, it ceases to grow, and will die.

2. **Air holds up the clouds and other forms of water.**—What comes from boiling water? Where does steam go? It rises into the air. The air holds it up. If it were not so, clouds and steam and vapour must fall to the ground. Clouds float on the air, as a dry sponge or a light piece of cork floats on water. The *air carries the clouds* from place to place.

3. **Air is needed to make fire burn.**—Illustrate this by a lighted candle or taper. Place over it an inverted tumbler. The flame gets lower and 'goes out.' If burning coal or wood is pressed close, it goes out, because no air can get through it. This is why we 'poke the fire:' the poking *lets the air in.*

4. **Air spreads light and heat.**—Where does light come from? It comes in straight lines from the sun. It passes through the air; but the air spreads it about on all sides. It does so with the sun's heat. So we get the light into rooms through windows which do not look towards the sun.

Let the class repeat,—

Air is everywhere about us.

All living things breathe air.

Without air we should die.

Air holds up the clouds.

Air keeps fire burning.

Air spreads light and heat.

(*Revision.*)

THE FIRE.

(*Paper, firewood, coal of proper size, and matches to be shown and used as the lesson proceeds.*)

I. **Introduce** by general remarks, and questions about *the use of fire at home.* No house, in which people live, is without it, for *warming*, *cooking*, *boiling water*, *washing*, etc. Where the fire is put—the *grate;* why made of iron; the *hearthstone*, the *fender*. Why these are needed. The cheerful, cosy look, the pleasant warmth, when it is cold, or dark, or wet outside the house, etc.

II. **How the Fire is made.**—1. **What is needed to make the Fire.**—Watch mother, or whoever does it, getting the things ready. What things are needed? *Paper*, *wood*, *coal*. Why not *coal* alone? It will not light from the match alone; it must be warmed, and lit by fire near it. Why not wood alone? As we generally have it, it *burns too quickly;* it *will not last.* The use of the *paper?* It quickly lights, and lasts long enough to light the wood; the wood quickly lights, and lasts long enough to light the coal. What three things are needed to lay the fire? What is then needed to light it? The wood in small long pieces, the coal in small lumps, to light quickly.

(*Recapitulate.*)

2. **How the Fire is laid.**—Watch again. The ashes and dust at the bottom of the grate carefully cleared away. Why is this? *To let in the air.* Fire will not burn without *the air we breathe.* It will *go out,* as a child or bird would die if shut up from the air. This is why we *poke the fire.* Explain the pushing apart the lumps of coal with the poker; why the *dull* fire brightens, etc. To lay the fire well we must think of this *need of air.* What is put first? Why the *paper?* Then? Why *wood* next? Lastly, the *coal.* What if the paper and wood were put *upon* the coal? Show how flame *goes up.* *Gas flame*, *candle flame—all flame* does so. If the coal is at the bottom, the wood and paper would burn away without lighting it. The flame of the burning paper *rises to the wood;* the flame of the *wood* to the *coal;* each gets lit in turn. The paper is *crumpled* up:

why not *laid flat?* Show clearly again the need and mode of getting *air.* How the wood is laid. Why crosswise. The lumps of coal laid lightly on, touching each other, but not closely packed. Why?

(Illustrate by laying paper, wood, coal, in proper order, on a slate, or, better, in a box open at top and one side to represent a grate.)

(*Recapitulate.*)

III. **The Uses of Fire.**—(*a*) **In the house.**—1. **To give warmth.**—The *discomfort* of cold: without warmth we should be *ill;* in cold weather and cold lands none could live without it.

2. **To cook food.**—Much of what we eat must *be cooked.* Bread must be *baked*, meat *roasted*, other things *boiled: baking, roasting, boiling, frying, toasting, all need the fire.*

3. **For washing and ironing.**—Clothes cannot be washed, or made fit for wear, without *hot* water; for this there must be fire. Ask for other uses in the house.

(*b*) **In other ways.**—Refer to some of the many kinds of work in which fire is used. *The blacksmith.* What he does with fire. Why iron made red-hot? To *bend* and *shape* it without breaking, by hammering, and other ways.

(Illustrate by a piece of sealing-wax: it is hard, and breaks if we try to bend it; held over the gas, or fire, it becomes soft, and may be bent, or twisted; if heated more, it *melts*, and may be made to run, or to be moulded like soft clay, in any shape or way. So *tin*, *copper*, *silver*—all *metals* are worked by use of fire.)

Fire is used in making *glass;* for *engines*, and the steam which moves them in *shops*, on the *railway*, in *steamships;* for making *gas* to give us light, and for almost every kind of work done by men fire is needed, for the work itself, or the tools to work with.

(*Recapitulate.*)

IV. **The Danger of Fire.**—We must be careful *what we do with fire.* It is to be *used, not played with.* Many children have been *burnt*, and sadly hurt, or have even died, through being *careless* with fire. Burning paper or matches thrown upon the floor have *set houses on fire.* Great mischief and harm have been done even by children in this way. Caution the children as to touching fire, or being near it.

BLACKBOARD SKETCH.

THE FIRE.

MADE—with Paper, Wood, Coal.

LAID—lightly above *each other.*

FIRE NEEDS AIR.

USES—{*At home: Warming, Cooking, Washing.*
For Working and Melting Metals.}

THE DANGER—{*For Use.*
Not for Play.}

I.—WATER.

(For the Upper Section of an Infants' School.)

(*The aim of these lessons is, first, to impart knowledge respecting water; second, to help in training the observant faculties. The things spoken of and described should, as far as practicable, be shown to the children in the course of the lessons.*)

I. **Introduction.**—Awaken curiosity and interest by a pleasant reference to the glass of water before the class. 1. **Where it came from:** *in a town* or city we turn a tap, it flows through a pipe from the *cistern;* other pipes bring it a long way underground, from *ponds, streams, rivers,* far away: *in the country* it is got from *springs* flowing up from the earth, or from *brooks* and *streams* running down the hill-sides; or *pumped* up, or drawn in *buckets,* from deep *wells.*

2. **The commonness of Water:** found over all the land, in *streams, rivers, ponds,* the great *sea.*

3. **Its many uses:** *cooking, drinking, washing, working;* no house could be built, no steam-engine could move, hardly any work done, without it. Every living thing needs it, plant and animal alike.

4. **The many strange ways in which we see it:** the *clouds* floating in the air, the *rain* which falls from them, the *rivers* and *streams* of every sort, the great *sea* itself; the *hail*, the *snow*, the *ice*, all alike are *formed of water.* Let us learn all we can about it. First look well at—

II. **The glass of Water.**—1. What does the **eye** tell about it? How *clear* and *bright* it is; we can *see through it;* it is *transparent.* Drop a penny or a marble in the glass, put a pencil in, hold a book on the farther side: each can be seen. What else is like water in this? Why are such things called transparent? What colour has water? It is not *red*, like blood, nor blue, nor yellow: *water has no colour.* What is its shape? In the glass it is round, as the glass itself is; in a square bottle it is square; in a dish or plate it spreads out to the edge, whatever shape it may be. Then, of itself, *water has no shape*, it takes the shape of whatever holds it. When at rest, the top of the water is *level* and *smooth.* Shake the glass: the top of the water is now in ridges and hollows. It is the same in ponds, and rivers, and the great sea; sometimes at rest and smooth, at other times raised up in great ridges. What are these ridges called? What moves the water in this way? The *wind* blows upon it and raises the great *waves;* these are rolled upon the shore and dashed upon the rocks. The water is broken into small drops, which spread far and wide.

2. Now let the **finger** teach us something about it. Touch the water in the glass: you can push it easily aside; it lets the finger pass through it. Lift the finger gently: some of the water comes with it; it makes a little line or *column* between the finger and the top of the water, holding together while the finger is held near. When it falls off it makes a? *little drop.* What shape is it? What other drops is it like? Notice the marks made by the first rain-drops which fall on the dry pavement. Lift an *empty* glass, now lift the glass of water: what is the difference? *Water, then, is heavy; it has weight.* A child

could carry but a small pail of water. A large pail is a load for a man.

3. Can we learn anything about water from the **nose** and the **tongue?** Try it. *Clean water has no smell, nor any taste;* yet how pleasant to drink when we are thirsty.

Put your finger into the water, now pull it out: is there a hole left? What fills it up? Where does the water come from? It flows in from all sides, filling the hole, and leaving the top level again. (Show difference when such a hole is made in clay, earth, sand, etc.) Tilt the glass on one side: what happens now? The water flows over, falls on ground, spreads on every side. Try to take up a handful, or even a pinch of it, from the glass. Why cannot this be done? It slips between the fingers. Things which flow in this way are called *liquids.* What is a liquid? What other liquids do we know?

Put into the water a lump of sugar, or of salt, or a bit of chalk. Watch it: you see the outside of the lump breaking away. Stir it: soon it is all broken into small pieces. You cannot see the bits of sugar, or salt, they are so little. Where are they? The *tongue* can find them, though the *eye* cannot. You cannot take a drop without tasting it. The white bits of chalk show this also to the *eye.* Water breaks many things into small pieces in this way. We say, *Water dissolves many things.* Drop a little ink, red or black, into the water: see how quickly the colour spreads through the water.

III. **Recapitulation.**—Let us now put together all that we have learnt about water. Where does it come from? *Ponds, streams, rivers,* etc. How do we get it in our houses? It is brought through *pipes* under the ground into the *cistern.* What is water used for? *Cooking, drinking, washing,* etc. In what different forms do we see water? In *clouds, steam, rain, rivers, sea, hail, snow, ice,* etc. What does the *eye* tell us about water? It is *transparent, colourless,* has *no shape,* is *easily moved,* forms *waves,* is a *fluid,* etc. What is meant by *transparent?* How do we know transparent things? Name some. What are *waves?* What makes the waves of the sea? What is a fluid? Give the names of some fluids. What does the hand help us to find out about water? It is *heavy,* it holds *together,* it can be *easily* *pushed aside*, etc. What does the *nose* teach us about water? and the *tongue?* What happens to sugar when put into water? What is meant by dissolve? What other things are dissolved in water? etc. etc.

II.—WATER.

Begin by a careful revision of the chief points of the previous lesson. This is best done by a series of questions, covering the whole ground, admitting of short, simple answers, connected together and summed up by the teacher.

I. Revision of previous lesson.

We now know many things about water as we see it every day. Let us next learn—

How Water changes.—By Heat.—1. About Steam. What happens to water when it is put in a saucepan or kettle over a fire? It *soon gets warm.* What makes it warm? The fire is kept from the water by the kettle. But something passes through into the water. We cannot *see* it. But we may feel it by putting the hand near the fire. It is called *heat.* What does heat do to the water? Where does the heat come from? Heat also *comes from the sun.* As the water gets hot something comes out from the spout or from under the lid. What is its colour? Where does it go? This white something which goes into the air is called *steam.* What is steam? How is it made? As the water gets hotter little bubbles rise up to the top—we say the *water boils.* How fast the steam goes off now! What happens if water is left boiling a long time? It all 'boils away.' What has become of it? It has *changed into steam.* Some of the steam lodges on the wall or the window-pane. See what happens then. As the steam gets cold, little tiny drops of it run together and trickle down in little drops of water. So *steam is really water.* Let us now say what we have learnt about it. Water is made hot by *heat from the fire.* This changes it into *steam.* Steam gets cold by the heat passing out of it. This changes the steam back again into water.

2. **The clouds are great banks of steam.** This steam is called by another name—*vapour.* Where does this vapour come from? What must go into the water to make it steam?

Where does the heat come from? The sun then warms the water. This changes some of it into steam. It rises and forms? *clouds.* When the clouds are made cold, what will happen? *They change again to water.* What becomes of the water. What do we call it?

(*Revise.*)—What happens to water when it is made hot? What is steam? What two things are needed to make steam? What is another name for steam? What does steam change into? What must first happen to it? What are clouds? Where do they come from? How is the water changed to cloud? What is the cloud changed into? etc. etc.

III. **Another way in which Water changes.—By Cold.**—Look at a pond or a pool of water. It moves and sparkles, and though not so clear, is like that in the glass. Go to the pond on a cold winter day. What has happened to the water? It is covered with ice. What is ice? Where has it come from? Touch it: it is *cold* and *hard;* when thick you may even walk on it. It is firm and clear, like glass, and will break like it, too. It is called *brittle.* Say the word with care. What is meant by being brittle? *Being hard and able to be broken, like glass.* Name other brittle things. Hold a bit of ice in your hand: what happens to it? It *melts* and is *changed into water. Ice,* then, as well as *steam, is only water changed.* But what must happen to water to change it into ice? We may tell this by putting our hand in as it is changing. How does if feel? Now what must go into the water to make it steam? What must go out of the water to make it ice? The change made by the cold is called *freezing. Ice is frozen water.* Let us now see the difference between *steam* and *ice.* Steam is water with *much heat* in it. Ice is water with *little heat* in it. Water falling from the clouds is called? *rain.* Sometimes the drops are frozen hard; this is? *hail.* Sometimes the water comes down not in drops, but in *white flakes.* What name do we give it? Hold some hailstones or snow in your hands: what does it change into?

(*Revision.*)—Name all the different ways in which water may change. What must go into the water to make steam? When heat comes out of water, what is made? What is ice? What is meant by freezing? etc. etc.

We must now learn some of—

IV. **The uses of Water.**—We see it in use every day. 1. Let all try to tell some of its uses *at home.* For *drinking* and *cooking.* How used for *breakfast*, *dinner*, etc. We have no meal without it. For *washing.* Dirty *faces*, *hands*, *clothes*, and *rooms* would all be bad every way. To be *well* and to be *comfortable* we must be *clean.* But this can only be done by using water.

2. Some of the uses *out of doors.* Of what uses is it in the *garden* and in *fields?* No flower, or grass, or tree can grow without it. How do people go long journeys from place to place? More often by *railway* and *steamboat* than in other ways. But what moves the engine of the train or ship? Of what is the steam made? Steam-engines, too, are used in very many other ways and for very many kinds of work. Then think, too, of the ways in which water is used for *building houses*, and *watering roads*, and *putting out fires.* The water in *rivers* and *seas*, too, is used for carrying on it *boats* and *ships*, for *travelling*, and for *trade.*

(*Revision.*)—Mention the different kinds of ways in which water is used at home, out of doors, for plants, for men in work, in travelling, etc. etc.

THE SUN.

I. **Introduction.**—Refer to the *sun* as seen day by day. Where? When? It *rises* in the morning: where should we look for it? Gets higher in the sky till midday: what time is that? In the evening it *sets.* In what direction shall we look for it? What comes from the sun? Its *light makes the day.* It wakens up men, birds, all living things. What else comes from the sun? The life of every living thing depends much on the sun. The sun takes a longer time from its rising to its setting on some days than on other days; so the days are not all of the same length. When are the shortest days? The longest? It is the time of the sun being up which makes the seasons. How many are there? Name them. Which season have we now? When is the longest day? The shortest?

II. **What the Heat and Light of the Sun do.**—Speak of the difference between winter and summer. The changes are made by the sun. What heat does to the *snow*, *ice*, *water*, etc. How does the heat of the sun change the water? What becomes of the vapour? Of the clouds? *The sun causes rain.* Effect of heat on growth of plants, trees, etc. What happens to grass when shut out from the light? The *greenness* of plants is *caused by the light* of the sun. What the sun does to the corn, fruit, etc. After many days of sunshine comes? *the harvest.* Effect of the heat upon mud, clay, etc. Name things which are *softened* by the sun. Name some which it *hardens*. The heat of the sun *brings many things to life*. The bee, the butterfly, all insects come out in the sunshine. The egg is hatched by its heat. From it comes the grub or caterpillar. Other living things are brought forth in the same way.

Let the class repeat,—

The sun causes plants to grow.

The sun causes rain.

It brings many things to life.

Its light and heat bring joy and gladness, etc.

III. **The Sun itself.**—Where do we see it? It is a long long way off; many times farther than the greatest distance, upon earth; far away out of the reach of man. How it looks. Small, bright, flat, round, like a plate. A large round ball at a great distance looks much like it. The sun is shaped like a ball, but it is *many times larger than the earth.* It seems to us to move, coming up, passing over the earth, going down again. It really *stands still.* Why, then, does it seem to move? Because *the earth moves round towards it.* (Illustrate by the way in which houses, trees, hills, etc., seem to pass us as we move in a railway train or steamboat.) What makes the sun look so small? Because it is so far away. Show that this is so with all things at a distance from us.

(*Revise and recapitulate.*)

Write on the Blackboard for class repetition a few short, easy sentences containing the main facts.

LIGHT.

I. **The Light.**—1. **The sunrise.**—Begin by speaking of day and night. What makes the difference? Darkness is the time of rest. Light is needed for work and play, and the busy part of our life. Interest the children by a description of the dawn of the day and the sunrise. While it is night the birds and the beasts of the field about us are still. Most of the work of man has ceased. As the morning comes on a faint light is seen in the sky. It shows a little of the clouds, and quickly and quietly grows brighter and stronger. In what part of the sky is it first seen? It spreads over the whole sky, it touches the tops of the hills and of the tall trees and high buildings. Where does it come from? At first the sun cannot be seen. Soon the round, bright rim of the sun comes up just where the sky and the earth seem to meet. Then the light finds its way to all parts, brightening the dark valleys and the gloomy woods, and makes its way to every open place.

2. **What the Light brings.**—Are the birds silent now? They begin to sing; the beasts of the field rise and move about; men go out to their work; the world is soon full of life. What has caused all this? The light of the sun makes the day. By it joy and work are spread all around.

II. **The Work of the Light.**—We have seen what it does for man and other living things. Besides this, it brings life to the plants. Very few plants can grow in the dark. The greenness of the grass and of the leaves, the colours of the flowers and of the fruits, are all caused by the light. Plants could not get their food without it. How swiftly it moves too! The sun is very far off; so are the stars and the moon. Yet the light comes that long, long way far swifter than any living thing can move or the swiftest steam-engine can run. It comes gently too. You open your eye, and the light strikes quickly upon it from the lamp or the sun. Does it hurt your eye? Yet the eye is so tender that the tiniest speck of dust is enough to injure it.

The Light brings safety.—In the darkness we are in danger, we cannot see our way. Speak of its use in the lighthouse, the railway signal, the street lamp, etc., in guarding against danger.

III. **Different kinds of Light.**—We get light from different sources. In the day from? *the sun.* At night from? *the moon and the stars.* Then, too, *the flame of burning things gives light.* Refer to the *fire-light* from wood and coal, the light of the *gas*, the *candle*, different kinds of *oil* and *spirit.* By these in the darkness of night we have light in our homes and for all sorts of uses.

RAIN.

(For the Upper Section of an Infants' School.)

I. **Introduction.**—Describe a shower. Walking on road or field, the rain begins to fall. If, when it begins, we are on the road or pavement, we may see, where each drop falls, a *round* splash or mark; others come quicker and quicker, we run to get home, or under shelter. The drops fall faster, quicker than any one could count, till housetops, pathways, roads, fields, are all wet. Water runs from roofs through pipes to gutters; it streams down the hill-sides and roads. Where does it come from? Where does it go? How came it up in the sky? What does it do for us? Let us try to learn all about these things.

II. **Where Rain comes from.**—Look up; we cannot see the blue sky; why is that? The dark or grey clouds shut out the sight of it. They spread far and wide between us and the sun, so that we do not see or feel its bright, hot shining. We may see them sometimes in patches, sometimes heaped up like great banks of snow, or spreading all overhead like a dark curtain. They move to and fro, slowly or quickly. What moves them? What are these clouds? We may know this quite surely, for they are not always high above us. They sometimes lie close upon the ground, covering trees, and houses, and all things about. We call it *fog. Fog is cloud close to the earth.* As we walk through it, it feels *damp.* If it stays long, little drops of water trickle down the walls and palings. *Cloud, then, is made of water*, and rain *comes from the clouds.* But how do the clouds get up so high? And in what way are they formed? Let us think of what our lesson on water taught us about this. What happens to water when it is made hot? What becomes of the steam? How is it changed back again into water? Where does the steam come from which makes the clouds? What name is given to steam made by the sun? *It is called vapour.* Vapour is sometimes so fine and light that it cannot be seen. What other things are about us which we cannot see? We breathe *air*, we feel *wind*, we burn *gas.* Can we see these? So vapour is sometimes like *air* and *gas*, and cannot be seen. Let us now put together the things we have learnt. Rain comes from the *clouds.* Clouds are *vapour*, held up by the air. The vapour comes from the *water* on the earth. It is the water *changed* by the heat of the sun. The rain is formed when the cloud is made cold. It flows back again to the rivers and sea from which it came.

(*Revision.*) *

III. **What Rain does.**—What becomes of the rain when it falls on the ground? Describe the course of the water as the rain falls from roads and pavements into the gutter, and down into passages and pipes made for it, so flowing a long way underground till it reaches the *river.* Much of it falls on garden or field, soaking into the earth. What it does for plants, and trees, the earth itself, in fitting it for seed, plants, etc., or it goes down through the ground, reaching hard rocks or clay, through which it cannot go. What then? It makes its way out at last, through cracks or soft places in the hill-sides, and forms *springs*, or it soaks into *wells.* How cool and pure the water is now! What is done with this water? That not used flows away, joins other water in streams down hill-sides, etc., and forms *brooks.* What is a brook? Many of these run together, and make the *river.* The river, then, is formed and kept flowing by the *rain.* Without it, it would dry up and cease to flow. The rivers flow to the *sea.* So the rain gets back again to the places from which it came.

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* Each several point should be obtained from the children, in *their own language*, by the help of questions, inversion of sentences, etc.

The rain does more than this. In the air is dust, smoke, many things which we cannot see, but which would harm us if we breathed them; the rain carries these down to the earth as it falls, so making the air fresh and pure. It washes the leaves of trees, and plants, and grass, making them clean and bright, and keeping them in life. Rain cools the earth in summer, and cleanses the streets of busy towns far better than could be done in any other way. Rain is thus full of use to man. Think of this when it stops your play and your pleasant walks.

(*Revision as before.*)

IV. **How Rain comes.**—When does it come? We know of some things that they will surely come, and when. We cannot tell the exact days on which the rain will come. Not like the shining of the sun, which comes every day all the year through, or the rising and falling of the tide day by day. Describe briefly the quick coming and sudden stopping of *showers*, the heavy rain and fierce blowing of *storms*, the long, steady pouring of rainy days, etc. Sometimes the sun shines when it rains. What is then seen? How gladly each one runs to see the rainbow! The light of the sun shines through the little rain-drops, and is spread out in the beautiful arch of pretty colours far up over sky and earth. What is the name of this arch in the sky?

We have rain at all times of the year. There are lands in which no rain falls for many days and weeks; the ground is parched and dry, flowers droop, plants stop growing, grass is withered, all seems dying. Then the great rain-storms come, far heavier than any we ever see here. The people look out eagerly for it. Why? The earth drinks it in through the hard, dry cracks, the seeds quickly grow, the grass puts on its bright green again, flowers, trees, and plants, and all living things seem to rejoice.

(*Revision.*)—What is rain? Where does it come from? What are clouds made of? What is vapour? What must be done to water to make it vapour? What happens to the clouds when they get cold? Where does the rain go? How are rivers made? What does rain do to the air? What is a shower? What is a storm? What happens when the sun shines on rain?

Some principal facts in short sentences may form the

BLACKBOARD SKETCH.

RAIN comes from Clouds.
CLOUDS are Vapour.
VAPOUR is Steam from Water.
,, from Sea, Rivers, Ponds.
RAIN keeps Plants alive.
,, makes Rivers.
,, cleanses the Air.
HEAVY RAIN is a Storm.

SNOW.

I. **A Snowstorm.**—With the help of the children, describe a snowstorm. The season of the year in which we expect it; the coming on of the dark grey clouds; at first a few flakes, slowly, silently falling; then more come; we look out of window or doorway, and see many coming thickly, one after the other; the ground on street, yard, garden, field, the trees, the house roofs, are all white. There is no rushing sound, no *pattering* as of rain-drops, no clattering and clashing as of hailstones. Why is this? *The snow is soft and light.* Where does the snow come from? What are the clouds made of? Snow, then, is *made of water.* Let us learn more about—

II. **What the Snow is.**—1. **Nature and qualities.**—Refer to the lesson on clouds; how and of what formed. Water is changed by heat. What becomes of it? It is *changed into steam.* What becomes of the steam? It *rises into the air.* Another name for it? Vapour. The vapour or steam is water separated into very, very tiny drops. The air high up above the earth is cold; in winter it is very so. What happens to water when made very cold? *It is frozen.* The vapour may be frozen, and then is called *snow.* What, then, is snow? *Snow is frozen vapour of water.*

2. **Why is Snow so light?**—Compare with water, of which it is formed. It would take *nine* cups or vessels of snow to weigh down one such vessel of water. We say snow is nine times lighter than water. Or, again, the nine full vessels of snow, if melted, would fill but one of the vessels with water. Explain how, because of this, as it first falls it comes lightly and gently on flower, blade of grass, tree-twig, etc. But when much falls it makes a very heavy weight, crushing sometimes what it rests on, breaking the branches and boughs of trees, etc.

3. **Why Snow is white.**—This can be made to some extent understood by reference to the *foam* of the sea-spray, the whiteness of *steam*, *mist*, and *fog*, all of which are forms of water. The air gets between the little particles of water, and the light which falls upon the air comes back white from it and from the tiny drop of water. As snow is pressed close together it gets darker in colour. It gets hard too. Refer to a snowball; the snow clings together when pressed by the hand, and may be made hard as a frozen ball of ice.

III. **What the Snow does.**—1. **It keeps the cold away** from whatever it covers. Touch it. How does it feel? Is it not strange that something so cold should keep anything warm? Show that the cold which nips and freezes plants, and animals, and the earth, is *in the air.* The snow falls and covers everything as with a white blanket; so the cold frosty air cannot get at the tender, springing plants, etc. They are kept safely under the snow while it lasts.

2. **It waters the earth** gently and thoroughly. Show how, as it slowly and gradually melts, the water enters the ground instead of flowing quickly away as rain-water often does.

3. It helps to **make great rivers.** On the tops of high mountains great depths of snow lie all the year through.

Explain how, as it slowly presses its way down the hill-side, the warmer air melts the edges of the snow, the water flowing down and forming rivers in the valleys below. Illustrate by the slipping of snow from steep roof-tops on high houses.

4. **Snow slips.**—Describe the snow avalanche, the great huge masses of snow sliding and slipping down the steep mountain-sides, then falling with a great crash on trees and houses, burying cattle, sheep, even men and women. Sometimes these have lived several days thus buried in the snow. Show that air must have made its way through the snow or they must have died. In some cold lands people dig out great *snow houses* out of the snow, and are sheltered snugly from the cold winds and storms of those lands.

RIVERS.

I. **Introduce** by referring to any river known to the class. If there be none, describe what is commonly seen at the *river-side.* The great wide stream of water always moving—*flowing*—in one direction or other; in some rivers very *quickly*, in others *slowly*, bearing along *boats*, of different sizes, with few or many people. If the river be very large, there may be on it large vessels, *steamboats*, and even *ships.* By comparison with a known river or brook, describe the difference between the river as it flows through the *country* or past a *town. In the country* few boats and people; leaves, pieces of wood, now and then the branch of a great tree floats past; along the sides grow trees, bushes, wild flowers, and many *water-plants. In the town*, boats, barges, and larger vessels come close to the side. Often the river-side is built up with stones like a wall; heaps of things are piled up, some to be taken away by the vessels, others which they have brought. *Bridges* cross from side to side, and a busy *trade* goes on day by day.

II. **General Description.**—1. A wide **stream of water** flowing between two *banks.* Land near the sea is called *the shore.* Land near the river is? a *bank.* We stand by the edge of the river and can see to the other side.

2. Describe what would be seen on a supposed journey

up or down a river. Starting from the *town* we pass under the *bridge.* What is the use of the bridge? In what parts are the greatest number of bridges? Why are there more near the towns? We go past streets, houses, and the great warehouses, etc., where goods are stored. Soon the *country* is reached. On the banks are *trees, fields* slope down to the water's edge; or *gardens, cottages,* fine *houses,* etc. etc., are near; the river gets narrower; on one side or other another river or stream flows into it. Further up, the river still gets narrower and is not so deep; many smaller streams come in on each side; these *make the river.* A river is made up of many streams; smaller as we near the beginning of the river, larger as we go farther down. At last it is a tiny stream, too small for a boat to float on it, coming from a hill-side, or from pools of water.

3. **A journey down the river.**—As we go this way it gets broader and deeper. The boats and other vessels on it are larger; the streams which flow into it are larger also.

4. **The colour of the water, and its quickness.**—After much rain there is more water in the river; it flows quicker, and is stronger to carry things down the stream. Sometimes it sweeps away trees, great pieces of earth, even houses, and living things. It washes the earth out of the land, and so *changes the colour* of the water. Sometimes it is *clay.* What will the colour be? Sometimes it is *chalky land.* The colour then? Sometimes dark mould.

5. **The tides.**—The water does not always flow *down* the river. In parts near the sea the water flows back *up* the river twice every day. Twice it flows down towards the sea. This is called *the tide.* How often does the tide come? And from where? Ships and vessels can be floated up and down by the tide. The water of the river is *fresh.* What does that mean? What is the taste of sea-water?

(*Revise.*)

III. **Where the Water comes from.**—A river is made of many streams. Where they begin the water sometimes *comes up out of the ground.* What is this called? Sometimes it comes *from deep pools of water* on high lands. Sometimes it *oozes out of the ground.* But how does it get into the spring or into the pool? The water comes *from the rain*, or in some lands *from snow.* Where does the rain come from? What makes the clouds?

Let the class repeat,—

Water from sea and land is drawn up by the sun.
It forms the clouds.
Rain is formed from the clouds.
It soaks into the earth and falls into the pools.
It comes up again as springs.
From springs and pools are formed rivers.

IV. **Where the Water of the River goes.**—Some of it *soaks into the land.* What does it do to the land? Some of it is *drawn up by the sun* to make clouds, rain, and other rivers. Much of it is *taken out to be used* by people for drinking, washing, and many ways. Most of it *flows down to the sea.*

(*Revision.*)—Specially noticing features in the description—how rivers are formed, what becomes of the water, and the many uses of rivers.

THE SEA.

I. Introduction.—The Sea-Shore.—Ascertain who, in the class, have seen the sea. If familiar to them, ask for particulars; if not, describe in simple, pleasant words, the sea-side. The great stretch of water, ever moving, sometimes gently, sometimes rolling towards the land in great waves, dashing on the rocks, or washing up over the loose, round stones, or the smooth sands. Speak of the water coming up on the land at one part of the day, and then going back again, till lower or farther out. Twice every day and night, the *tide* thus comes in and goes out. Describe the many things to be seen at the sea-side or shore of the sea. The pebbles, sand, seaweeds, and many shells; boats, small and large, lie near the shore;

far out may be seen ships passing to and fro, or great steam vessels; how we know them apart; the white sails of the ships, the long cloud of smoke from the chimney or funnel of the other.

II. **The Sea.**—We look far out over it, and see nothing but water; it seems a long way off. If we sail out as far as we can see, the water still stretches beyond. We may go on, till we lose sight of the land; on every side is the great water. Winds blow over it; storms come; the water is rolled up into great waves; they toss the ships from side to side, sometimes dashing them against the rocks; what must happen then? They are *broken in pieces*,—the ship is *wrecked*. Again it is smooth, the water is *calm*, boats and ships go gently on it. How great the sea is! Ships sail on and on; steam ships move very fast for many days, on all sides nothing but water is seen, till at last once again land is reached. Sailors, passengers, all on board are glad to hear the shout *Land ahead!* What does this mean? Why are they glad to hear it?

The depth of the sea is great too. Refer to deep wells in the ground, the deepest water known, etc. The sea is deeper far. How is this known? Describe the great weight on the long cord or small rope. It is let down from a ship into the sea; the long time it takes, till the weight strikes the bottom. All this great wide depth is *water*.

III. **What is in the Sea.**—Speak of fishing: many ships taken out every lay; many men in them fishing; how this is done; describe the hooks, and lines, and nets; the many sorts which are caught, their great numbers, what is done with them, etc. What else comes from the sea? In some parts *sponges*, *corals*, *shells*, *seaweeds*, etc. (Show specimens.)

But more than this. Over a great part of the sea the sun shines strongly. What this does—what happens when the sun shines on wet grass, etc. So the sun draws water, like steam, from pools, rivers, and especially the great sea. What becomes of the water? Up in the air it is changed into *clouds*.

Let all repeat this,—

Clouds are formed by water from the sea.
The water is drawn up by the sun.

There are cold Seas.—On some parts the sun does not shine much. In some parts, not for many days together. What happens to water when very cold? Describe the polar seas: the great mountains of ice, called icebergs. These sometimes break off from the land and float on the seas. There is the home of the whale, and the seal, and on lands near it of the polar bear.

(*Revision.*)—What things are seen by the sea-shore? What is the tide? How often does it come and go? What is a shipwreck? etc.

Repeat sentences as,—

The sea is wide and deep.
Its water is salt.
From it we get fish, sponge, coral, shells, seaweeds.
The sun draws up the water of the sea.
This makes the clouds.
From them comes rain.
Icebergs are mountains of frozen water, etc.

Group 7.—Lessons about Plants.

SEEDS, AND HOW THEY GROW.

I. **About Plants.**—Begin by talking generally about plants. Recall what has been taught in previous lessons; the different kinds of plants, trees, shrubs, herbs, etc.; when seen, where they grow. The different kinds seen at different seasons. Some live for a short time and then die, others last a long time. Ask for the names of such. When plants first come out of the earth they are very small. Do they remain so? *All plants grow.* Some never become large. Some grow to a great size. Name some of the largest trees. Name some of the smallest plants. Where do plants grow? *Out of the* *earth.* But what do they grow from? *All plants grow from seeds.*

II. **Seeds.**—Show some different kinds of seeds. Question and describe as to differences of *form*, *colour*, *size.* Most seeds are very small, but some are larger. Where do seeds grow from? In what part of the plant are they found? The *seeds* of most kinds of plants *grow in the fruit.* Refer to and show specimens of as many kinds as possible of common and well-known seeds. The *pea* and the *bean* are well-known seeds. The *acorn* is a seed. Of what plant? The *pip* of the apple and of the orange, the *kernel* of the nut, *grains of wheat*, caraways, peppercorns, the *coffee berry*, the '*stone*' of the plums, cherry, etc., are all seeds. Ask for the names of other seeds. The fruits of some plants have but few seeds in them; of others, very many. How many seeds are in the apple? Who can count the seeds in a great sunflower? How many are in the plum? Some seeds are covered by a thin skin (*apple pip*), some by a hard shell (*nut*), some have a pretty little kind of feathery top (*dandelion*, *thistle*).

III. **How Seeds grow.**—1. **What they need.**—Where are seeds generally put to grow? They are covered up in the dark earth and lie there for a time. But let us see what they must have to make them grow. If seeds are shut up in a dry box will they grow? No. Why is that? What then do seeds need? *Moisture.* Would they grow if kept in snow or ice? Why not? *Seeds need warmth.* So if seeds are shut up where no air can come to them, they will not grow. How many things must seeds have that they may grow well? What are these three things? *Water*, *air*, *heat.*

2. **How they grow.**—Describe the sowing of the seeds, or their dropping from the plant; their being covered by the earth; their lying for a time, during winter, etc., as though dead. Are they really dead? If we should take them up after a time, and look well at them, we see what has happened to them in their growth. First, the moisture in the earth has made them swell. The covering of skin or hard shell bursts open. There grows down a tiny little thread-like stem; this is the tiny *root.* It grows downwards, pushing its way among the earth. From the sides other little threads grow; these are

the little *rootlets*. What are these for? *To get food for the plant.* But what else is happening all this time? From the other end of the seed *a little stem grows upwards.* It pushes its way up through the earth out into the sunlight and air. What part of the plant is this? *It is the stem.* What grow upon the stem? *Branches, leaves, flowers, fruits.* Last of all, *other seeds* like that from which the plant first grew.

TREES.

(For the Upper Class of an Infants' School.)

(*Illustrations to be provided: A small tree, with roots attached, showing as nearly as possible the whole of the parts. Pictures of several kinds of trees. A few specimens of leaves, fruits, etc., referred to in the Notes. These to be shown, as necessary, during the course of the lesson.*)

Introduction.—Speak of trees as commonly seen by the children; their different sizes, small and very large, growing singly or in great numbers together, the spreading branches, bare in winter, covered with leaves in summer, casting their shadows on the ground. How *beautiful* their shapes, their movements by the wind, as they stand in the fields and on the hill-sides. How *useful* too, sheltering birds and beast, and giving fruit while they grow, and wood for *making many things*, and for *fires* when cut down.

Let us learn the names of—

I. **The Parts of a Tree.** — While growing, one part is hidden in the ground. Its name? *the root.* Standing up from the earth is? *the stem* or *trunk.* From it spread out on all sides? *branches.* Their small ends farthest from the stem are called? *twigs.* On these grow the? *leaves.* Among them, on many trees are? *flowers* or? *blossoms.* As these pass away they leave the? *fruit.* Sometimes, not always, this is *nice to eat.* Name some. In the fruit is found? *the seed.* How many parts have we named? Let us say them again. *Root, trunk, branch, leaf, flower, fruit, seed.* (Each to be shown when named. One or more of the children may be called on to point them out, in the picture or specimen.)

What are the small ends of the branches called? Where do the leaves grow? What is left by the flowers? Where is the seed found? etc.

We must now know—

II. **The Uses of the Parts.**—1. About the **root.**—What is it doing in the earth? Try to move the tree; you cannot. The wind blows strong against it; it stands firm. How is that? What holds it there? So *the root holds the tree in its place.* Has it another use? Cut a plant from its root, what happens? *It withers and dies.* Then *the root keeps the tree alive.* But how does it do this? You eat food day by day, and thus you *grow.* The tree must have food also. What must be given to every plant to keep it alive? The water goes through the earth, and into the root, taking with it tiny bits of things which feed the tree. So *the tree gets most of its food through the root.* Of how many uses is the root? What are they? How is a tree fed? etc.

2. Now about the **stem** and **branches.**—What does the stem or trunk do for the tree? One thing is easy to see—it *holds it up in the light and air.* But how do the water and food get from the root to the branch and leaf? It can be *only through the trunk.* Then the trunk has *two uses*—what are they? The branch is like the stem, and of the same use, but is smaller and *grows from the stem,* instead of from the ground. *One* stem, *many* branches. The trunk is strong to bear the great weight. What is it made of? *When cut down we call it wood.* The outside of the trunk covers it *like a skin.* It is called the *bark.* Some bark is thick and rough; some is thin like the skin of our bodies.

3. **The leaves.**—Look at them. How many there are! More on one tree than any boy or girl could count! How pretty they look, as they shine in the sunlight, and wave to and fro in the wind. What is their shape? Notice the many different sizes and shapes of leaves. Broad, large, roundish (lime, maple, horse-chestnut, etc.); small, notched (elm, rose, birch, etc.); long, narrow, pointed like long green needles (firs, pines, etc.). The edges are smooth (laurel), wavy (oak), notched, spiny (holly); rough, smooth, prickly, all kinds may be found. Leaves *help to get food* for the plant, and to *make*

it grow. If they were all picked off, a plant would quickly die. Name different kinds of leaves. What is their use?

4. **The flowers.**—Who does not love flowers! We like them because of their? *pretty shapes, beautiful colours, sweet smell.* Most of the flowers we know are on small plants, but many grow upon trees. The pretty bunches of blossoms grow *white* on the cherry-tree, *pink and white* on the apple and pear, *white or pink* on the May-tree (hawthorn). The great clusters stand upright on the *lilac* and *horse-chestnut;* they hang down like golden chains on the *laburnum.* The flowers of many trees are pretty *green* clusters, beautiful in spring-time (maple, oak, birch, lime, etc.).

Flowers soon die; the outside leaves wither and pass away, but the inside part stays, and grows into the—

5. **Fruit.**—What do we mean by fruit? *Something nice to eat.* Name some. How different these are in shape and other ways—an *apple* from a *grape*, a *nut* from a *plum*, etc. Many fruits are *not good for food*—acorn, horse-chestnut, pods (laburnum), cones (pines, firs, etc.). Inside the ripe fruit is found the—

6. **Seed.**—Look for it in the *apple, orange, nut, pod,* etc. Seeds differ in *shape, colour, size,* etc. What is the use of seeds? They lie in the ground; in the dark earth they *sprout* and *grow;* the little roots grow down into the earth; a small shoot rises above the ground; it grows into a tiny plant; from it comes a *tree*, like that from which the seed came. What tree grows from the *pip* (seed) of an apple? from the *acorn?* etc.

(*Revision.*)—What is bark? Where does it grow? What does the trunk do for the tree? What are the uses of the leaves? What kind of flowers grow on the lilac? laburnum? maple? Where does the fruit grow? Name different kinds of fruits. Where is the seed found? What is its use? What tree grows from an acorn? etc.

We must now learn a little about—

III. **The Uses of Trees.**—They are of use *while they live.* Trees *look beautiful* as they grow. We like much more to look over hills and plains on which they are growing than when bare — so (1) *trees give pleasure.* From them we get much *that is good to eat*—thus (2) *trees give food.* In their branches birds *build their nests*, under them cattle and other *animals rest* —so (3) *trees give shelter.*

Trees are of use *when cut down.* Of their wood men *build houses and ships*—(4) *for building.* From wood is made things *used in houses*—(5) *for furniture;* things for *working with*—(6) *for tools.* Of wood we make fires—(7) for *burning.*

How many uses while living? How many when cut down? Name these. Try to think of other uses. Look for this at *home*, in *school*, wherever you are.

Let the class repeat a few of the principal facts in simple sentences, thus:—

Trees have root, branch, leaves, flowers, fruit, seed.

The root keeps the tree in its place.

Through the root the tree gets its food.

The trunk of a tree gives wood.

Timber is another name for wood.

Some fruits are not good to eat.

Trees give pleasure and shelter.

The wood is used for building, for furniture, for burning.

THE OAK.

(*In addition to a good picture of the oak tree, there should be provided specimens of the leaf, acorn, oak apple, wood, bark, cork*)

I. **General Description.**—Our lesson is about one of the largest and finest trees in our land. Ask for the names of largest kinds of trees known to the class. Where they are seen growing. The name given to a large number growing together? A large number of *fruit* trees? Difference between a forest and an orchard? Names of forest trees? Of trees in orchards? In shrubberies? The chief use of forest trees? Of orchard trees? Of shrubberies?

The Oak is a forest tree.—It is one of the largest anc finest looking. Show the picture. By its help, describe th*general appearance* of the oak. Its thick and tall trunk; th great spreading, twisted branches; the fine covering of it leaves; its rounded form; its thick, rough, ridgy bark; th long, slender, green flowers in spring; the pretty acorns i bears; the firm, strong, noble look it has when full grown *The great oak grew from an acorn.* It takes many years to ge to its full size: more years than the life of most living mer Some living oaks now covered with green leaves have grow for hundreds of years. Every spring-time since they firs pushed their way up through the earth, they have put fort their pretty leaves. Every autumn they have borne their prett acorns.

II. **The Parts of an Oak Tree.**—1. **The root.**—Where i this? It is *hid in the ground.* Describe how it stretches fa and wide, and deep in the earth, as the great branches sprea in the air. In what does it differ from the branches? *Roo bear no leaves.* Of what use is the root? It keeps the tree i its place. The great winds blow upon it, but it is firm. *Tl root holds it up.* Of what other use is it? *The root gets t food for the tree.* What does the tree feed upon? Water, tir bits of earth, and other things which cannot be seen. Th water goes in through the roots, carrying the food with it, u into the trunk, and out into the leaves. But for this the tr could neither live nor grow.

2. **The trunk and branches.**—What is got from the trunl What is it called when cut? From the trunk we get *woo timber.* What is the trunk covered with? *The bark is a ki of skin.*

3. **The leaves.**—Speak of their *great number.* Show a describe their *colour*, *size*, *shape;* the rounded curves of t edges; the *stem;* the *blade;* the *ribs*, or nerves.

4. **The flowers.**—The two kinds; the long, slender catkir on other branches the little cluster of firm, hard, green, bu like flowers. The catkins soon drop off; the others rema They get large and ripen. These are—

5. **The acorns.**—What are acorns? *Acorns are the fruit the oak tree.* Show and describe as before the pretty gre

cup, rough on the outside, smooth within; the smooth, hard, nut-like acorn which it holds. Split one and show the thin, firm, leather-like *skin*, the firm, fleshy *kernel.* This is the *seed* from which the great oak tree grows.

III. **What is got from the Oak.**—1. From the trunk? and branches? Let the class see the firm, hard, strong, tough wood; the pretty *grain* it has. It is very useful, and lasts a long time. Ask for its many different uses: in building houses, ships, bridges; things made of it in the school, in the house, in the workshop, etc.

2. **The bark.** — Show, describe its uses. For making leather. Cork is the bark of a kind of oak.

3. **Gall nuts.**—For making ink.

4. Acorns are eaten by pigs and other animals.

(*Revision.*)

THE DAISY.

(*For the proper illustration of this lesson, it would be well to give each child a common daisy, or, better, for showing the chief parts, the large ox-eye daisy. The teacher should also have a complete plant or two. At some seasons of the year this will not be practicable; a drawing, or picture illustration, must suffice.*)

I. **General Description.**—Show a daisy, or picture of one. Its name. Who have seen the daisy growing? All but the youngest will remember it. Where seen? When? Speak of the great number; their pretty look; almost like little stars among the grass. Who planted or sowed them? Many flowers have to be carefully planted; they perish if not well cared for. The *daisy*, like many others, grows up year by year without this care. What are such flowers called? Name other wild flowers. Where do wild flowers grow? Some in *hedgerows;* some on *heaps of rubbish*, some by the *sea-side;* the daisy in the *fields.* What other flower grows often by it? Refer again to the pretty appearance of the white daisy and the yellow buttercup, brightening the green fields. When first the flower comes it is a little green ball. What is it called? *The bud.* (Show one.) The bud opens and the delicate white leaves spread out. It spreads out to the sunshine. When the sun goes away the

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2. **The trunk and branches.**—What is got from the trunk? What is it called when cut? From the trunk we get *wood, timber.* What is the trunk covered with? *The bark is a kind of skin.*

3. **The leaves.**—Speak of their *great number.* Show and describe their *colour*, *size*, *shape;* the rounded curves of the edges; the *stem;* the *blade;* the *ribs*, or nerves.

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> 'The daisies have shut up their sleepy red eyes.'

II. **The Daisy Plant.**—It has *root*, *leaves*, *flower*. What is wanting that many plants have? It has no *stem* on which leaves grow. Where then do the leaves and flowers grow from? They grow out of the *root*. Many plants are like this. Name some—*lily*, *dandelion*, *violet*, etc. Leaves grow from the flower-stem of the *ox-eye daisy*, but not from the *common daisy*.

1. **The root.** — Show and describe the mass of whitish thread-like fibres. *It is fibrous*. What does this mean? Why so called? The thicker stem-like parts are the *roots;* the small fibres growing out from them are *rootlets*, *i.e. little roots.* Uses of the root? Show how they spread. Each root holding firm in the ground; through each the water from the soil gets in, taking the *food* with it on which the daisy feeds. As the winter comes on, the flowers die off, and most of the leaves, but the root lives on, shut up in the dark, during the cold weather. At the right time it will send up fresh leaves and flowers. When will that be? Let us look again as the spring comes on for the daisies.

2. **The leaves.** — They lie thick together, growing from the top or *crown* of the root. Note shape, size, colour, etc. *Green*, *thickish*, *soft*, of a sort of *spoon shape*, *edges notched*, etc. What is the use of leaves? They help to feed the plant, as all plant leaves do; they brighten the earth with their greenness; they protect the young flowers; they are part of the food of cattle, sheep, rabbits, and other living things.

3. **The flower.**—The long, slender, delicate stem growing out from between the close-packed leaves, its colour, shape, etc.. On its top the flower. One only on each stem. Name other flowers like this. Some with many flowers on each stem.

Examine the flower carefully; the pretty *green cup* outside, made of many leaves; the branchy *white petals* inside it, tipped with red, inside again the *yellow parts.* Cut it open. Show that there are really *very many flowers*, tiny but perfect; the inside ones *yellow and short*, the outside *white and long.* Each little flower has all the parts which bigger flowers have, though very small, and each has in it a tiny seed. From such a seed the plant grows.

4. **Other flowers like the Daisy.**—There are very many such, which seem to be one, but are really many, growing close together,—*coltsfoot*, the early yellow spring flower, coming before its broad, green leaves, seen often on rubbish heaps and railway embankments; *dandelion*, the prickly *thistle;* *camomile*, good for medicine; the great *sunflower*, *tansy*, *yarrow*, blue *cornflower*, and many others.

(*Revision.*)

GRASS.

(*Pictures and specimens of the various grasses and plants spoken of should be provided.*)

I. **General.**—Speak of the pleasantness of a run in the green fields; how much nicer than on the hard, dusty road, or even the gravelled playground. What makes it so nice? *The green grass.* When dry we may sit or lie or even roll upon it. The tiny leaves of grass bend, but come up straight again. Though we tread on it, it still lives and grows. Where does grass grow? In *fields* and *meadows*, and *garden lawns.* Where else may we see it? On hedge-banks, roadsides, waste places, even on heaps of rubbish; the grass comes 'creeping everywhere,' covering the sides and the tops of steep, high hills. Some kinds grow on sandy places near the sea-shore, some in wet, marshy lands. Hardly any place can be found in this land, where there is ever so little earth, on which grass will not grow. Then, too, it lives on through the whole year. Many plants spring up from seeds and grow through the summer-time, then die. Grass lives through the cold winter weather, springs up fresh and green in spring, and grows tall and strong through the summer.

* II. **Parts of the Grass Plant.**—(Teacher to show on her specimen, or on a good picture, each part named, the children noticing and pointing to the same part on theirs.) As we see the grass it often has only short, straight *leaves.* When fully grown, each plant has *four parts*—(1) the *root*, (2) the *stem*, (3) the *leaves*, (4) the *flower.* Let each point out and name carefully these several parts.

1. **The root.**—A little bunch of stems—long, whitish, thread-like, growing from the bottom of the stem; from them smaller threads grow. Such things are called *fibres.* The root of the grass is *fibrous.* Through the fibres tiny drops of water, too small to be seen, pass in, taking with them bits of the earth which lie around the roots. *This feeds the plant.* Let all repeat what the root is; why called *fibrous;* what fibres are; what the root does for the plant; what the plant feeds on; what else the root does for the plant.

2. **The stem** grows from the root; straight, round, green, slender, stiff; on it are *joints*, count them, see how far apart, how they swell from the stem, etc. Try to break the stem; it is *tough;* when broken it is seen to be *hollow*, except at the joints. Round it are wrapped the lower parts of the leaves. Like the roots, it is made of long fibres, covered with a soft green coat. The stem holds up the leaves and bears the flower.

3. **The leaves:** green, long, narrow, flat, thin, pointed; they are called *blades.* Why? What else is called a blade? In what is a blade of grass like a knife blade. Carefully take off a complete leaf. Show its two parts—the split *sheath*, which wraps round the stem; the *blade*, which grows above it; where and how the blade parts from the stem, etc., the long, delicate, straight, even-growing veins, etc.

4. **The flowers:** at the top of the stem. Show how they lie one above the other; each made of small, thin, dry leaves, which clasp each other; inside are the little, tiny, hammer-

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* At this point of the lesson it will be well to give to each child in the class a good specimen or two of a complete grass plant. If given out earlier, it may distract attention from the first part of the lesson.

like things, from which come a powdery dust, and inside again the tiny things which grow to *seeds.* What is the use of the seeds? They fall into the ground; from them other grass plants grow. Then from some of the joints of the stem, other roots grow, so the grasses spread. In what two ways does the grass grow? The seeds are blown by the wind on all sides. In this way the grass is spread everywhere.

III. **Kinds and Uses of Grass.**—The grass in a field or lawn seems to be all of one sort. Yet some leaves are larger, stiffer, or softer, than others. The flowers show by different sizes, forms, ways of growing, etc., the *different kinds* of common grass. Show flowering specimens of a few common sorts —as cock's-foot, cat's-tail, fescue, rye-grass, oat-grass, etc. Why so named?

The use of grass? Chiefly *food* for many sorts of animals. What animals do we see eating grass? *Horse, cow, sheep, rabbit.* Birds of many sorts feed on the seeds. Some even eat the leaves. The ripe grass is cut and dried. When? How cut? What called? Describe the busy, pleasant time of haymaking, the *haystack,* storing food for winter use. Hay is grass cut and dried in the sun.

Speak of the *prettiness of the grass.* How sad-looking the bare earth would be if there were no grass. How quickly and prettily it covers up the rough, bare waste places and heaps of rubbish. Grass *gives pleasure* by the green smooth covering it makes it.

There are other plants much like grass in form, but larger. All *corn plants* are grasses. Names of these. *Wheat, oats, barley, rye.* So is *rice,* and even the *sugar-cane* is a large kind of grass plant. Uses of these. The stems of many grasses when dry are woven or plaited into many useful things. Ask for, and describe these. *Common grass* when dry makes hay. Corn stems when dry make straw. Speak of the uses of straw in farmwork, stables, etc.

LEAVES OF PLANTS.

(Specimens of various sorts of leaves should be provided, as well as pictures of trees, leaves, etc. If practicable, let each child have a typical leaf of some sort, to be referred to as the lesson proceeds.)

Introduce by showing specimens of several sorts of leaves. Ask for such particulars about them as the class can give. Where from? Colours? Shapes? What other common things are shaped like them? Time of year when most leaves grow? The great number which may be seen in the summer-time. It is well to look about that we may learn all that our eyes and hands can teach us about leaves, etc. What becomes of leaves when the summer has gone? What trees keep their leaves? What trees lose them? Kind of leaves which cannot be seen during the winter, etc.

The beauty of Leaves.—Bring on successively the fine covering they make for the trees, their pretty look as they are moved by the wind, and glisten in the sunshine, or stand out in large, dark masses as the daylight fades; their different shades of colour, light, dark, spotted. The leaves of the plants and flowers, the leaves of the grass, as well as the leaves of trees, cover the earth with their beauty, and give us pleasure as we look upon them. The forms of leaves and the shapes they give to the trees are copied in pictures, on wall papers, and in many other ways. This makes home and things about us *pretty*, and adds much to the *joy* of life.

Different kinds of Leaves. — Most leaves have two parts, the *stem* and the *blade.* Show these; let the class point them out on their leaves. The *stem* will bend, but is strong; some very long, others short. The *blade* is flat and broad, or long and narrow. The *edge* is smooth, notched, wavy, round, sharply pointed, deeply cut, etc. From some, grow sharp pointed prickles. The *surface*—smooth, hairy, rough, wrinkled; the hairs of some will sting, others are stiff and will prick. The *veins*—one up the middle, or several branch from the stem: from them other veins go straight or curved; in many they make a pretty network. In others the veins run side by side, from end to end. (These differences as referred to should be pointed out in different leaves, as oak, chestnut, beech, elm, lime, nettle, nasturtium, ivy, holly, laurel, grass, lily, etc.) These leaves have one blade only on the stem; others are made up of *several little leaves*, as rose, ash, acacia, clover, horse-chestnut, willow, etc.

Position of Leaves.—Some *grow from the root* out of the ground. The leaves of many garden plants do this, as the *primrose;* others grow from the stem or branches; name such. These sometimes grow singly (*oak*, *elm*), one above another; others in pairs or *opposite* (*dead nettle*, *elder*, etc.). In some, many leaves grow together round the stem (*goose grass*, *madder*, etc.). Some grow in bundles, as *pine* tree, larch, etc. Their leaves are narrow and stiff—needle-like.

Uses of Leaves.—Ask for the names of plants the leaves of which are of use. The kind of use, etc.; cabbage, lettuce, tea, watercress; how used, etc. Rhubarb, its great leaf, we eat the *stem* of it; its great size, etc. Some leaves are used for medicine, as *senna*, its bitter taste. When is medicine needed?

Their use for *shelter* to birds, beasts, men. Leaves are of great *use to the plant* on which they grow. Air gets into the plant through the leaf. Moisture passes out from it. Plants *need food; its food is made ready in the leaf.*

(*Recapitulate. Revision should follow each division of the lesson.*)

LESSONS OF REVISION.

One of the most essential elements in the process of acquiring knowledge is that of revising, re-presenting to the mind, past impressions. The information gained as the result of a lesson needs to be secured by reiterated impression. One obvious mode of doing this is that of repeating the same lessons two or three times in the course of a year, as suggested in the *Instructions to H.M. Inspectors*, referring to Object Lessons in Infants' Schools. Another valuable expedient is that of distinct Lessons of Revision.

It is highly desirable, in dealing with young children, to have a variety of resources by which to diversify methods, whether of instruction or of discipline. This enables the teacher to sustain the interest, and to stimulate and train the mental faculties of the little ones, without subjecting them to undue stress. Thus, in Lessons of Revision it is sometimes best to make them consist for the most part of a *series of questions*, simple, clearly expressed, and covering more or less fully the outlines and chief details of the lessons to be revised. These questions for infant classes should be just sufficiently suggestive to give reasonable help to the young intelligence in recalling past impressions. But they should be so formed as not to comprise in them the matter which properly belongs to the answer; else the answer will consist of a trivial word or two, or be an almost worthless echo of the question.

Again, revision lessons may be based upon the *pictures and illustrations* used during the revised course of lessons. For this purpose specimens of the subjects of these lessons, or of pictures, or other illustrations used in the course of giving them, should be at hand. They will greatly aid in sustaining the interest of the children and in stimulating their recollection of the lessons.

A liberal use, too, of well-formed *elliptical sentences*, which are really a modified form of questioning, will be found helpful and interesting, with young children especially. The absurd use, or rather abuse, of ellipses should, of course, be avoided, in which the omitted word is so unimportant as to require no effort of intelligence to fill it in; or, still worse, when the teacher gives a part of the word which the children are expected to complete. It will often be found that young children who are unequal to the effort involved in finding the thought and expression required in a complete answer, even though a simple one, will delight in taking their part in elliptical conversation with their teacher.

Another very interesting variety of revision exercise is that of *mutual questioning*. One child standing in his place in the class, or brought out in front of it by the teacher's side, is encouraged to ask any questions which occur to him bearing on the lessons to be revised, the class to give the answers; or members of the class, selected by the teacher from those who lift their hands, may ask questions of the one standing out, who remains there till a question is asked which he cannot answer, when his place is taken by the one who has puzzled him. The teacher will find plenty of good opportunity for encouraging, correcting, and guiding the children both in questions and in answers. Done with spirit and tact, this proves a very interesting and useful exercise.

It is not necessary, nor indeed desirable, that the lessons should be separately revised, or that they should be revised in the exact order in which they have been previously given. It is often better, instead of exhausting the revision of each lesson, successively in turn, that the questions should range over several lessons grouped together, according to the way in which they are severally related, so that questions of the same kind or on similar points in the different lessons may follow each other.

The answers should be required to be individual or collective, according to the nature and the form of the question. From time to time, as the revision proceeds, simple statements embodying the principal facts and conclusions elicited should be distinctly repeated by the whole class, and so committed to memory.

The following Notes of Lessons of Revision, based upon the preceding lessons, are intended to suggest the form, and the method, which such exercises of review should assume.

The questions are not intended to indicate the exact form or order in which they should be asked, so much as to suggest how they may be made to depend one on the other, and to link together the items of information forming the subject-matter of the various lessons. They can be readily multiplied, or modified, as the circumstances of the class may make expedient.

The answers, where given, are not necessarily such as should be expected to be given at once by the children, but rather such as contain points and statements to be reached, it may be, by several successive questions.

Group 8.—Lessons of Revision.

COMMON OBJECTS.

Object Lessons, on *Salt, Coal, Sponge, Glass, Apple, Cocoa nut, Leather, Paper.*

Introduction.—Specimens of each of the objects should be at hand, and should be constantly referred to as the revision goes on, for suggestion or for illustration. A little well-directed questioning and observation will lead the children to see that some of the things before them were **made, manufactured** wholly or in part by men, while other of the things have **not been made.** For the elder children this may lead to the explanation and the use of the terms **natural** and **artificial.**

Of the things **not made,** two were *got out of the ground,* one *from the sea,* two were *parts of plants.* The **manufactured** things are three. So the lessons may be grouped thus:—1. Salt, Coal, Sponge. 2. Apple, Cocoa-nut. 3. Glass, Leather, Paper.

1. **Salt, Coal, Sponge.** — Ask for the name, the chief qualities, and the uses of each, in succession. Where each comes from. How each is got. In what are all three alike? They have *weight,* though one of them has less weight than the other two. Which is that? How can we mark the difference? The sponge is? *light.* The coal and the salt are? *heavy.* They are all *useful.* They are alike in **not being made.** What is the right word for this? Other *natural* things? Things which are not natural? etc. In what these differ each from the other. In *colour.* The salt is? *white;* the coal? *black;* the sponge? *brown.* What else may we notice in the salt? It is made up of **little bits.** The names of these? *grains.* What other things are known which are made of grains? The coal is in *one piece.* How may we break it? **By knocking it.** What do we say of it because it is hard but may be broken? **Coal is brittle.** Can we break the sponge in the same way? Why not? The sponge is *tough,* etc.

2. **The Apple and the Cocoa-nut.**—In a similar manner bring out clearly the likenesses and the differences between

these. What are they? *Both are fruits.* Each *grew on a tree.* The names of the trees? Both are *good for food*, and are *pleasant* to eat. The shape? and colour of each? The several parts of each, and in what they are different: the thin *rind*, and thick, juicy *pulp*, the *core*, and the *pips—seeds* of the **apple:** the thin, tough, smooth *skin*, the thick lining of brown, tough *fibres*, the hard shell, the thick, juicy kernel, the sweetish, watery kind of milk inside the **cocoa-nut.** Where each grows; how we get the cocoa-nut here. The use of each, etc.

3. **Glass, Leather, Paper.**—A like process should be followed with these objects. The special qualities of each; wherein they are alike, wherein they differ, the different use to which this leads; the *brittleness* of the **glass,** the *toughness* and *strength* of the **leather,** the *thinness* of the **paper.** The materials of which each is composed, and some, at least, of the facts which were taught in the previous lessons, concerning their manufacture, should all come successively under review.

The lesson may close by calling upon individual children to state in their own way some of the facts which they have learnt, the sentences, corrected, if necessary, by the teacher, to be repeated by the class, as—

Salt and Coal are got out of the earth.

Sponge is got out of the sea.

Salt is used for eating.

Coal is used for burning.

Sponge is used when washing.

The Cocoa-nut grows on a palm-tree.

Apples and Cocoa-nuts are fruits.

Leather is made from the skin of the cow.

Glass is made by melting things together.

Paper is made from rags, etc. etc.

A Lesson of Revision.

NATURAL PHENOMENA.

Lessons on Natural Phenomena.—The whole or any number of the lessons given in pp. 111–134 may be thus dealt with.

The Lessons on *Earth*, *Air*, *Fire*, may be taken successively.

The Lessons on *Sun* and *Light*, and the Lessons on *Water*, *Rain*, *Snow*, *Rivers*, *Sea*, may form two groups.

1. **The Earth.**—What is the earth? The **world on which we live.** The two names given to it? The two kinds of parts of which it is made up? **Land and water.** What things are found in the earth? *Rocks*, *metals*, *salt*, *sand*, etc. What are small pieces of rocks called? Names of some rocks? of earths? Uses of these? Where are metals found? Differences between rocks and metals? Names of metals? Things made of metals? Metals in the house? school? etc. What is gravel? Differences between *gravel*, *sand*, *clay*, *garden-mould*, etc. What covers the earth on every side? So lead on to the lesson on—

2. **The Air.**—Where is the air? How we know it is everywhere about us; what it is called when moving; how we know it is transparent; what it does for us; its uses in *breathing*, holding up the clouds, making the fire burn, spreading the light and heat, etc.

3. **Fire.**—Where seen; how made; why paper, wood, and coal are used in making the fire. Its uses in the house, in the workshop, the engine-house, railway, steamship, etc. The two things got from fire (*light* and *heat*); the danger of fire, etc. etc.

4. **The Sun, and Light.**—Where, and when, do we see the sun? What is the sun? The *sun is a great rolling ball of fire.* In what part of the day is the sun highest in the sky? What do we get from the sun? In what part of the year do we get most of its light and heat? When do we get least of these? What changes are made in the day? in the weather? in the gardens and fields? Which is the larger,

the earth or the sun? Why does the sun seem smaller than the earth?

What makes the difference between day and night? Where does the light of day come from? What does the light bring to us? What does it do for plants? What other things give light besides the sun and moon and stars? How, and why, used for railway signals, lighthouses, etc.

5. **Lessons about Water.**—Name the different places from which water is got? What is a *spring?* a *river?* the *sea?* The difference between the water of the sea, and spring, or clear river, water? What change comes on water when made hot? When made cold? The names of the different forms of water? *Water*, *steam*, *ice*, *snow*, etc. What must be put into water to change it into steam? What makes the difference between ice and steam? What is snow? When do we see most of it? Why in the winter? Where does the water of the river come from? Where does it go to? Why does not the sea get overfull? What takes the water out of the sea? What becomes of it? What becomes of the clouds? What becomes of the rain? So trace out the connection between the sea, the clouds, the snow and rain, the rivers, the sea again.

A Lesson of Revision.

PLANTS.

Lessons about Plants (pp. 134–147).—*Seeds*, *Trees*, *The Oak*, *The Daisy*, *Grass*, *Leaves*.

The questions may range over the entire series of lessons without separating the latter into groups.

1. **Lesson about Seeds** (p. 134–136).—Ask a few questions about *plants in general*. What are they? Where seen? Different kinds, as *trees*, *shrubs*, *herbs*. What do all plants come from? **Plants grow from seeds.** Where do the seeds come from? In what part of the plant? What must be done with seeds to māke them grow? What do they need besides the earth? How many things are needed to make seeds grow? *Three.* Name them. *Earth*, *water*, *heat.*

How these come. *Land*, *rain*, *sunshine.* What two parts come out of the seed? In what way does the root grow? the stem? Let the answers be repeated in simple sentences, thus:—

From the seed come the root and the stem.
The stem of the plant grows upwards.
The root of the plant grows downwards.

2. **Lessons on Trees and the Oak and Leaves.**—(Pointing to pictures.) Name the different trees. Trees which grow in hot countries? Some which grow in cold lands? Names of fruit-trees? Timber-trees? Some which have leaves on them through the winter? The largest trees known to the children? Where does the oak tree grow? Name of its fruit? Kind of leaf it has? Use to which its timber is put? Things in the schoolroom made of oak wood? in the house? etc.

What are the two parts of a leaf? Why is the broad part called a blade? Ask for the uses of leaves, while growing? when picked? different kinds of leaves? different positions in which they grow? etc.

3. **Lesson on the Daisy.**—Where found? What kind of flower? Other flowers like it? Why called a **wild flower?** Other wild flowers? Its special parts? Difference between the outer flowers and the inner flowers? About the opening and the closing of the flowers? when they do this? Other flowers which do so?

4. **Lesson about Grass.**—Where grass grows? Kind of plant it is? Names of the parts of the grass plant? Kind of stem it has? of leaf? of flower? The uses of grass? Difference between grass and hay? Other plants like it in form and parts? etc.

A Lesson of Revision.

ANIMALS.

Lessons on Animals (pp. 46–69).

The lessons may be dealt with in this order:—1. About beasts. 2. About tame animals in this land. 3. About tame animals in other lands. 4. About the lion.

1. **Lesson about Beasts.**—Pictures of all the animals to be spoken of should be shown: the following are among the chief points to be brought out:—Ask the name of each. In what are all alike? *They all live on the land. They are all alike in general form, and parts; each has head, body, tail, four legs.* In what do they differ? In *size, covering, ways of living, food,* etc. Names of wild animals? of tame animals? Animals used for food? for the work they do? for what is got from them? (*skins, wool, fur,* etc.). What are beasts of prey? Names of wild animals which are timid? Animals which live much in the water? etc.

2. **About tame Animals in this land.**—Names of such? Where each is found? Why each is kept about us? Use of each? Kind of food? Differences between dog and cat? sheep and cow? How does a cat catch a mouse? How does a dog catch a rabbit? Kind of foot? tooth? mode of eating? Names of different kinds of dogs? etc.

3. **About the Camel and the Elephant.**—Bring out the chief characteristics of structure, modes of life, uses of each, etc. Where is the home of the camel? of the elephant? What in each fits it for the kind of life it lives? The use of the camel's hump? its long neck? its broad, spreading foot? the rough skin upon its legs? The use of the elephant's trunk? of its tusks? The kind of teeth it has? The food it eats? The work it does?

4. **About the Lion.**—Question similarly as to *structure* and *habits.* Where the lion lives? its food? how it gets it? What animal known to us is like it? In what the cat is like a lion? In what ways it differs from it? The kind of voice each has? The use of the whiskers? of the padded foot? etc.

A Lesson of Revision.

BIRDS.

Lessons on Birds (pp. 69–85).

Arrange the pictures which were used in the several lessons in view of the whole class. Point to each in succession and obtain name. In what are all birds alike? *Head, feet, feather, wings, tail, kind of mouth*, etc. In what ways they differ? The several ways in which birds move about? Flying, hopping, wading, swimming, etc. Names of wading birds? kind of legs they have? Swimming birds? kind of foot they have? What are birds of prey? Which of these is a bird of prey? Which other of these birds catches living creatures? What is there in the foot, bill, feathers, etc., which fits it for this? Where does the eagle build its nest? the sea-gull? the owl? the robin? Why does the owl like to live in the farmer's barn? When is the owl busiest? What kind of bird is the eagle? **The eagle is a bird of prey.** The owl? **The owl is a night bird.** The robin? **The robin is a singing bird.** The sea-gull? **The sea-gull is a sea bird.** The hen? **The hen is a scraping bird.** Of what use is the hen? **The hen gives eggs. Its flesh is eaten for food. Its feathers are of use in many ways.** Why does it scratch up the ground? What is the food of the sea-gull? How does it catch the fish?

Let the lesson be varied by mutual questioning,' as suggested above. After the questioning is over, call on children individually to stand and repeat in their own way such facts as they can remember about the lesson.

MORRISON AND GIBB, PRINTERS, EDINBURGH